Think Piece

Re-thinking Education for Sustainable Development as Transgressive Processes of Educational Engagement with Human Conduct, Emerging Matters of Concern and the Common Good

Rob O'Donoghue, Environmental Learning Research Centre,
Rhodes University, South Africa

> Human beings have developed within a world. Their cognitive functions evolved in continuous contact with objects to be recognised. The symbol emancipation, in the course of which socially acquired means of communication gained dominance over those which were genetically fixed, enabled humans to adjust their judgement and their actions to an almost infinite variety of situations.
> …
> Evidence shows that over the generations defects of knowledge can be mended.
>
> (Elias, 1991, p.121)

Abstract

The modernist expansion of Education is examined to explore how the concept of Education for Sustainable Development (ESD) has emerged, is being worked with, and is being assessed in imperatives intended to foster social-ecological change on a global scale. The opening review sketches how education developed as a mediating process in modernity, tracking some recent shifts that are shaping ESD in more and more diverse contexts of education practice. It scopes an ESD terrain where knowledge and ethics-led learning in relation to valued purposes might enable citizens to become engaged in change that secures a sustainable future for generations to come. Within these processes, competence specification is examined as a useful but under-theorised social imaginary for framing learning for future sustainability, primarily in teacher education and curriculum contexts. Here, ESD presents as an open process of situated social learning where emergent competences steer social innovation towards a more sustainable future (SD).

The paper attempts to navigate some of the current tensions in relation to knowledge and participation in these processes of learning-to-change. It probes ESD as praxiological processes of dialectical reflexivity that can become situated in contexts of risk and develop as transgressive[1] expansions within many conventional learning sequences in curriculum settings. The paper notes that current discourses on ESD and its assessment have often come to stand outside, and in contrast with, conventions of teaching and learning. These discourses also often conflate education and sustainable development in ways that ascribe change to ESD without adequately theorising the expansive and reflexive learning of citizens and how these processes might produce the desired change towards sustainable development (SD) in diverse contexts of learning in and about a changing world.

Overview

This paper opens with a review of the emerging concept of ESD and its development, to probe key dimensions of its expanding contours. In doing so, it scopes trends developing from prior to the Brundtland Commission's call for sustainable development in the 1980s to the formal advent of ESD within the United Nations Decade of Education for Sustainable Development. It also reaches beyond these into the UNESCO ESD Global Action Programme (GAP) and into an emerging focus on more sustainable planetary stewardship for a forthcoming focus on global citizenship education.

The approach taken is an examination of propositions that are framing ESD as a transgressive process in relation to an urgent cultural shift to future sustainability. It scopes how education emerged in modernity and is being worked with and assessed across widening initiatives into the UN-DESD. The enquiry is intentionally concerned with some of the broad contours of education and is developed as a scoping process that touches on key attributes of the expanding concept of ESD to inform our continuing work in southern Africa. The paper thus unfolds as a deepening conversation that seeks to navigate some of the open-ended origins of and developments in education and in so doing, to reconcile some apparent tensions in the widening contours of our ESD practices. It does not intentionally avoid any emerging contradictions but seeks briefly to point to and clarify some of these. The intention is also to probe for depth perspectives that might begin to resolve some tensions in relation to better-situated and knowledge-informed participation with higher order skills that bring some prospect of our becoming engaged in re-imagining our valued doings, knowings and beings in the sustaining company of others on a finite planet.

The enquiry reflected in the paper emerged when the Environmental Learning Research Centre in Rhodes University, South Africa was invited by UNESCO to co-convene a workshop with the National Institute for Education Policy Research, Japan to review the concept of ESD at the end-of-decade World Conference on Education for Sustainable Development held recently in Aichi-Nagoya, Japan (10-12 November, 2014). In examining the ways in which the concept was constituted and assessed, we traced expansive trajectories of ESD as quality education for all at the nexus of a 21st Century social reorientation in the face of rapid social-ecological change on a global scale.

Emergent Risk and Education Responses

The latter part of the 20th Century is characterised by education as a response to emerging risk within the modernist project. In southern Africa, early conservation education imperatives that developed into the 1960s were superseded by environmental education in the the 1980s (O'Donoghue, 2007). Perspectives then broadened further and were re-orientated within the United Nations Decade of Education for Sustainable Development (UN-DESD) that was implemented and assessed by many diverse groups around the world from 2005-2014. Here, further expansions developed as socio-economic and environmental issues escalated into a polycentric global crisis in the latter period of the UN-DESD, as reported in major

scientific reports coming out of the Stockholm Resilience Institute in Sweden and associated international researchers (Steffen , Crutzen & MacNeill, 2007), and amongst the Planet-Under-Pressure researchers (Planet Under Pressure conference 2012), including global change researchers in southern Africa (DST, 2010). These recent advances in knowledge and concern suggest the need for ESD and 'strong sustainability' (Neumayer, 2003) interventions for learning in a range of diverse contexts, levels and fora. It is from this focus that ESD takes its lead to foster corrective change in response to biodiversity loss, degradation of key ecosystem services, climate change, continuing poverty and the problems associated with sustainable production and consumption, for example, increasingly framed within the concept of a 'global change grand challenge' (DST/NRF, 2010).

The changes in the naming of successive educational practices and deliberation on associated guiding principles, processes and a changing scope of the education imperatives suggests differences and divergence. However, review of the processes involved reveals little more than subtle expansions and shifts in emphasis from earlier concerns with learning and change as outlined in Tbilisi Principles for Environmental Education in 1977 and subsequent international documents framing EE and ESD. These have entailed a broadening in the scope of education concepts and practices responding to wider and more complex risk emerging at a global level (Ahmedabhad Declaration, 2007). The expansions also reflect a concern with practices in relation to the wider social-ecological and economic domains of human activity as can be seen in an emerging emphasis on Green Economy in the recent UN Decade of Education for Sustainable Development report, 'Shaping the Future We Want' (UNESCO, 2014).

Tracing how education became a characterising feature of modernity in the 20th Century, Popkewitz (2008) describes the mediation of social life through responsive initiatives to educate citizens and to resolve emergent concerns. He notes how education as a modernist trajectory, initially included the massification of basic education to orientate citizens for life in a more complex cosmopolitan world. Latterly, there has been a proliferation of education imperatives in response to diverse risks and concerns that emerged within the modernist period of expansive socio-economic change. Here, education responses to risk becoming framed as interventions to resolve development-oriented problems. As will be discussed later in this paper, such framings have emerged in ways that have overlooked the nuance and contingency of teaching and learning processes and have commonly assumed a causal link between education and the production of sustainable development (structural functionalism).

The Instrumental Framing of Generalised Risk

Early education interventions to resolve social-ecological risk were institutionally framed within a structural functionalist disposition that sought to communicate information so as to create awareness and to foster changed behaviour (O'Donoghue, 2007). The scope of the *education, training and public awareness* interventions that preceded ESD initially assumed that, once successfully introduced into a curriculum, environmental education would create awareness and foster the necessary attitudes and behaviour change (Hungerford & Volk, 1990).[2] Developing environmental education initiatives successively became more centred on communicating

information on risk and enabling environmental problem solving, a process of environmental education that commonly included hands-on nature experience for problem solving and learning to foster pro-environmental behaviour. Here, awareness-centred and environmental problem solving pedagogy became more individualised amidst struggles to achieve and measure the desired pro-environmental behaviour (Courtenay-Hall & Rogers, 2002). The problem of education achieving the desired ends persisted in a globalising 'risk society' (Beck, 2009) and education to resolve risk began characterising cosmopolitan contexts with circulating risk generalisation in relation to concerns[3] to be taken up into expanding education practices (Popkewitz, 2008a).

It is notable that in these expanding education responses to escalating risk, not only was the measurement of pro-environmental behaviour a surprisingly elusive and contested process, but new environmental knowledge was generated around what Bruno Latour (2004) eloquently refers to as 'matters of concern'. Emerging concerns in relaton to biodiversity and climate change developed as circulating abstractions and generalisations that became emptied of historical and socio-cultural attributes and detail. For example, biodiversity loss became a circulating generalisation demanding attention. In many African contexts, engaging the concept of biodiversity loss is not a clear-cut matter. Here, as in many contexts, biodiversity loss developed as an outcome of colonial and modernist marginalisation of indigenous people who had their livelihood options reduced along with opportunities to adapt to changing circumstances that were accompanied by a natural resource base depletion that continues to impact on quality of life. In education practices related to these concerns the mapping and assessment of behaviour change can be surprisingly vague and contradictory where the generalisation of biodiversity loss as an emerging global issue brackets out historical, cultural and ontological attributes that are important for a grasp of the problem in context. Such generalisations can thus compromise learner engagement with questions of better stewardship and change in a troubled and intractable context of continuing marginalisation and escalating risk.

As briefly mentioned earlier, it is evident that the behaviourist foundations and the sequential rationale for effecting behaviour change that underlie ESD were derived from the structural functionalist theories on learning of the day and an institutional assumption that assessment of the desired change was possible with psychometric instruments to measure changing states of awareness, attitudes, values and behaviour (Courtenay-Hall & Rogers 2002). An underlying assumption was also that measures of observable patterns of change would provide evidence of how education was producing the desired change (behavioural structural functionalism) to resolve the matters of concern.

A Participatory Turn for a Problem-centred Engagement in Future Sustainability

As practices emerged and evolved, education researchers began to note how structural functionalism after Tyler was too linear and undifferentiated for describing and contouring the engagement of citizens in processes of learning and social change (O'Donoghue, 2007). This was particularly notable in development contexts and in relation to the poor since the

mid-1980s when the concept of sustainable development after Brundtland (UN, 1987) and the Rio Earth Summit gave rise to development education for fostering sustainable development. Into the turn of the 21st Century, socio-economic development narratives receded against ESD, a concept that gave more prominence to education for future sustainability. This change was accompanied by an expansion from early 'education, training and public awareness' perspectives to a wider and more participative concern for 'community, education, training and public awareness'. The subtle change was not a trivial expansion and engaging citizen groups and individuals as participants in learning-to-change became a key focus for ESD into the UN-DESD. The participatory turn gave rise to multi-stakeholder civic structures and learning processes in Regional Centres of Expertise (RCEs), for example (UNU-IAS, 2014).

Put simply and in summary, the participatory turn in education practices gathered momentum as a shift from a focus on '**getting information to people**' to create awareness, to '**getting people together**' with information so that they can deliberate problems and endeavour to bring about change to resolve the concerns at hand. In this way, the resolution of complex socio-economic, environment and sustainability issues were downloaded to community learning contexts of social learning in which the problems were becoming evident (O'Donoghue, 1999). Here, the target groups of the past became participants in co-engaged education processes (an emerging participatory methodology) towards social innovation to bring about behaviour change.

Measuring Change Entrenched as the Gold Standard in Programme Assessment

From early on in the expanding game, reliable measures of change had been the gold standard or the 'holy grail' (Moore, 2012) for assessing impact as behaviour change. Measuring values/attitudes and behaviour were combined in the concept of pro-environmental behaviour as a trustworthy approach for the assessment of change brought about by education as a process centred on the production of new environmental behaviour (Hungerford & Volk, 1990). The shift to more participatory approaches and a socially critical trajectory in the 1990s led to behavioural measures becoming less prominent. Courtenay-Hall and Rogers (2002) note fundamental tensions between a 'behavior modeling' commitment to measuring impact as evidence of behavioral change, and participatory approaches that commit to stakeholder engagement in learner-led change practices. Towards the close of the UN-DESD, the resolution of this contradiction in favour of the latter (participation) shaped a slow shift from behaviour to environmental literacy (Hollweg *et al.* 2011). Today there is a proliferation of measures ranging from institutions that survey behavioural patterns in their target communities (see, for example, Rathouse, 2008 and Moore, 2012), to rapidly expanding tests of environmental knowledge/literacy (Hollweg *et al.* 2011) along with diverse programmatic contexts where consultant groups produce measurement instruments for the assessment of impact. Here, education-induced behaviour change and enhanced environmental literacy are juxtaposed in efforts to track, steer and evaluate education programmes directed at enabling change (O'Donoghue, 2014).

The expansions and shifts in assessment practices, briefly sketched above, are particularly notable in the rapid growth of citizen science from participants simply gathering data for

scientific endeavours to a co-engagement in environmental monitoring and responding to risk (Wals *et al.*, 2014). Here, the science in citizen science is developing as a transdisciplinary, multi-stakeholder knowledge co-production process with an integral education/learning focus directed at the knowledge generated being used to resolve local environment and sustainability concerns. Ways of thinking about each citizen learning to bring about a necessary re-orientation in a changing world and the search for evidence-based assessment of change with improved literacy, has continued to be a challenge in an expanding field of multiple stakeholder engagement in the emergent risk of the day, and now the escalating global risk to future sustainability.

Here, measures of behaviour change and their proxy measures remain in many formal state and university programmes and at an international level, with a recent shift to an emphasis on testing environmental literacy as an amalgum of knowing about risk, having the disposition to do something about this and, in so doing, developing higher-order competences (Hollweg *et al.*, 2011). When these programme and evaluation processes are read with care, it is apparent that concepts and assessment have seldom meshed with sufficient coherence. There has thus always been a search for refinements of programmes and the assessment of change. In the latter part of the UN-DESD, where calls for evidence-based assessment became pressing, the production and measurement of change become centred on contouring the necessary attributes (competences) for change to a more sustainable world; literacy (knowledge) in relation to sustainability concerns; and social learning trajectories to bring about the desired change (sustainable development).

Competence Specifications Contour the Attributes for Producing a Sustainable Future

One of the key frameworks developed to signify and assess emerging education processes has been an expanding initiative to specify competences (De Haan, 2010) for educators to undertake ESD and for its enactment as a curriculum process. The inscriptive framing of these processes for teacher education in the United Nations Economic Commission for Europe (UNECE, 2011) developed as a mapping of the following categories of competence for ESD:

- Learning to know (knowledge);
- Learning to be (identity);
- Learning to live together (social); and
- Learning to do (actions).

The emergent framing of ESD as competences developed alongside a wider trajectory of change in education and training where the earlier conventions of specifying objectives and skills was displaced by a concern for competences. This is notable from the Delores Report (UNESCO, 1996) and into the United Nations Economic Comission for Europe (UNECE) framework (2011) for initiating and assessing ESD[4] as a process of learning to transform society through participation in collaborative social learning that is produced by and produces the competences necessary for a sustainable future.

In framing ESD in this way for teacher education, each arena of competence specifies attributes in relation to 'holistic integration', the 'envisaging of change' by individuals and groups who then come to 'achieve the transformation' that the acquisition of the competences makes possible (UNECE, 2011). The specified practices for teachers and teaching are a mirror into ESD pedagogy but what is not evident is a coherent theory of learning and reflexive change that holds these propositions together to inform social learning for transformation towards a sustainable future. Compelling as such ideal frameworks are for charting transformation, and beyond their application in assessment and evaluation, they can be relatively empty checklists that are not easily enacted into curriculum settings by teachers. These frameworks have primarily been initiated for teacher education and into formal education curriculum and assessment contexts but have also been taken up more widely as social imaginaries for wider sustainable futures pedagogy through ESD (NIER, 2010; and Kadoya & Goto, 2014).

In these emerging approaches to ESD, existing education conventions have commonly been used as a foil in an expert-led process that narrates the need for change, spelling out a new, more relevant logic of practice, as one finds in the recent call for a 'strong sustainability' approach (Neumayer, 2003). Constituting something new to displace the old has been a core cultural attribute in modernist educational reform. Imagining new possibilities in this way can be useful for framing a revised vision for education as ESD and getting support for this, but the successful implementation of something new is not an easy matter and often fails owing to an inadequate grasp of complexities in the existing system. It is now more common to use these framings as tools for engaging educators in the reflexive initiating of change projects to transform their classroom and institutional practices.

The co-engaged steering of ESD with specified attributes (competences) deemed necessary for participants to produce a sustainable future, emerged with a trend in curriculum development towards the specifying of outcomes as attributes and skills to be acquired in learning programmes. Competence approaches reflect a concern for participatory learning with what participants know, muting an earlier emphasis on creating awarness through communicating what is known. For example, a 'world café' method is commonly used for engaging the present but often without the environmental information necessary to clearly bring the matter of concern into the public domain for attention. Here the concepts and systems thinking necessary to grasp subtle complexity and to anticipate what needs to change does not easily emerge, particularly in African contexts where the information resources of the internet are not readily to hand. The subtle shift from received knowledge to knowledge experience of the concern (and a failure to note the need for both) is evident in climate change work where apriori experience of changing climate is now commonly assumed. Exploring climate change in an area of high climate variability like the Eastern Cape needs new environmental knowledge of the southern Pacific oscellation alongside experience of local seasonal cycle dynamics for mediating competence to emerge.[5]

I noted earlier how the circulating knowledge in modernity is commonly emptied of the situated and socio-cultural attributes for enabling reflexive learning in a complex social-ecological context. With knowledge increasingly being vested in individuals and primarily approached as a co-constitutive process, competence frameworks are not readily brought into use without an

unintended 'dumbing down' of the mediating knowledge project with an attendant loss of higher order analytical skills and systems thinking necessary for informed grasp of the concern and a reflexive steering of change. The competence frameworks are, however, useful referents as social imaginaries that point to the need for increased learner-led collaborative work but this needs to be mediated in knowledge-informed and real-world contexts for development to be possible (see further discussion on this below). It is telling that Vygotsky, elaborating on learning around his concept of a zone of proximal development noted how:

> … learning awakens a variety of developmental processes that are able to operate only when the child is interacting with people in his environment and with peers. Once these processes are internalised they become part of the child's independent developmental achievement. From this point of view, **learning is not development**; however, properly organized learning results in mental development and sets in motion a variety of developmental processes that would be impossible apart from learning
> (Vygotsky, 1978, p. 90, my bold).

Here, careful work is needed on the mediated provision of knowledge resources, including learning sequences with knowledge provision, particularly the mobilisation of knowledge that is socio-historically situated and related to real-world problems in developing contexts.

Mapping some of the Expansive Dimensions of ESD that are Emerging

In Table 1, I have juxtaposed key attributes from the expansive progression noted above. The progressions are mapped from early structural functionalism to more collaborative approaches that were reframed as attributes (competences) for educators and learners to participate in the production of future sustainability. The progressions are reflected as an expansion and a broadening from early foundations and into the reframing of ESD as co-engaged multi-stakeholder learning-to-change within the UN Decade of Education for Sustainable Development.

An Expanded Perspective on ESD as Knowledge, Ethics and Aesthetic Actions

The developing attributes and shifts reflected in Table 1 are useful for noting some of the open-ended contours for ESD as reflexive processes of situated learning and change. Here the four clusters of attributes frame dimensions for ESD as co-engaged learning and social change (Figure 1):

- Situated knowledge and systems thinking (Knowledge);
- An ethics-led process in emergent context (Ethics);
- A valuing and purposeful process of learning with and from others (Values and Purpose); and
- Developing agency and skills in stewardship practices that bring about change (Actions).

Table 1. Trajectories of expansion towards and within ESD

Targeted intervention 70s	**Participatory critical process of problem solving enquiry 80s – 90s**	**Competence for educator / learning practices to achieve sustainability. UN-DESD 2005-2014**	***A expanded framework for ESD as reflexive critical processes of change***
Create awareness	Collaborative / Constructivist	Learning to know	***New environmental systems knowledge***
Change attitudes	Deliberative	Learn to be (Identity)	***Ethics-led in cultural historical context***
Change values	Situated values and purpose	Learn to live together	***Valuing and purposeful learning with and from others***
Change behaviour	Collaborative change	Learning to do	***Agency and skills in stewardship actions***
Get-to / get the message across			***Situated and purposeful learning in relation to valued practices and earth stewardship for the common good***
	Get-together / get all to buy-in		
		Emergent competences mediating change	

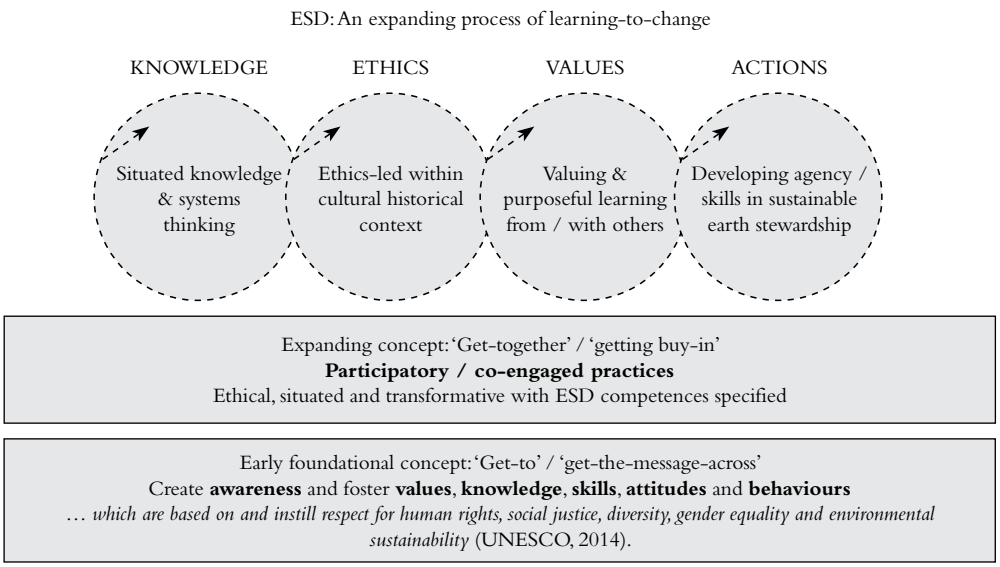
These intermeshed dimensions of an ESD concept reflect historisised reason and a rationalising narrative that developed within the political sociology of the time. Popkewitz (2008b), tracing some of the contours of 'a history of the present' in education quotes Rabinow to scope the changing contours of knowledge in modernity:

> Knowledge is conceptual because without **concepts** one would not know what to think about or where to look in the world. It is political because reflection is made possible by the **social conditions** that enable this practice (although it may be singular, it is not individual). It is ethical because the question of why and how to think are questions of what is good in life. Finally, all action is stylized, hence it is **aesthetic**, insofar as it is shaped and presented to others. (Rabinow, 2003:3)

Read in this knowledge-informed and situated way, ESD learning engagement in relation to a matters of concern might arise around what is known and develop around what is the right thing to do. These, in turn inform what is valued and can be done to bring about the necessary change for the common good. The framing of an education response that enables learning and change with reflexive dimensions that transgress existing dispositions and practices is not an easy matter. Education processes would appear to need to be both knowledge-informed and situated in the socio-historical context of risk, and be oriented to what is not yet known or done, but what is possible to bring about via new forms of agency (following the dialectical transformative praxis framework of Bhaskar 1998 in his *Dialectics: The Pulse of Freedom*). Where

grasp of how valued practices produce risk and are not in the interests of the common good, then a dialectical and reflexive process of learning and change can become possible in a given context and in relation to the matters of concern that need to be re-examined and changed.

Figure 1. Foundational and expansive trajectories in the concept of ESD



Contextualising ESD as Situated Matters of Concern and Transgressive Learning

Working with this expanded picture of ESD as reflexive learning to change, a series of questions can be used to engage a context and initiate education as a reflexive critical engagement in matters of concern towards change that transgresses the prevailing dispositions and practices currently producing risk. Here, framing questions to initiate situated critical engagement would appear to be:

- Knowledge-informed – What new environmental systems knowledge, emergent social-ecological detail and questions of social justice are informing the matters of concern?
- Ethics-led – How and why do these matters of concern need to be engaged and clarified?
- Valued purposes – Which practices are giving rise to matters of concern that need careful review and possible change?
- Actions – What concerns and change practices can be deliberated and explored as part of a transgressive process of learning-to-change?

The questions for opening up starting points towards reflexive learning processes that engage, clarify and resolve matters of concern, can often be developed as expansions of existing teaching and learning sequences so that what is known is engaged in a process of reflexive deliberation. For example, much of what is known (subject knowledge) is now being informed

by new environmental knowledge and systems thinking. This knowledge is reflected in subject disciplines as both foundational concepts and new environmental knowledge on social-ecological systems. These are taught in schools but often in fragmented ways. Alternative educational practices can emerge through questions in relation to knowledge, matters of concern, unsustainable practices and the need for change. These can situate and frame a reflexive learning programme (ESD) as a transgressive space within and around better situated and integrative work with the knowledge and skills of conventional school subjects. Contextualising and questioning processes that situate learning in this way can frame a sense of 'knowing what we don't yet know' and the need to find out or work out better ways of doing things together. Situated approaches such as this can establish the reflexive foundations of critical, co-engaged and action-orientated learning (ESD) that goes beyond the *status quo* (transgression).

How Situated, Participatory and Action-orientated Learning has been Emerging

Action research emerged in the participatory turn and a softening of institutional structural functionalism during the socially critical period of the 1990s. At the time, the focus on emancipatory change was accompanied by an individualising trajectory so that one had a constructivist pedagogy that involved collaborative learning where individuals in groups became involved in learner-led problem solving. This shaped a logic for educational practice that involved participants in planning an intervention, acting to try it out and then critically reflecting in/on the experience to assess the extent to which the matter of concern was being resolved.

Kurt Lewin is attributed with the advent of the idea of action research (Adelman, 1993) but readers of his work overlooked an important start-up step before the 'plan - act - reflect' process that came to characterise the participatory intervention methodologies for stake-holder engagement in ESD learning and change as an emancipatory process. Adelman (1993) notes how a populist framing of action research overlooked mediated depth engagement. For Lewin, action research was enabled through 'reconnaissance' of a context to get to '*connaissance*', a supported, grasp of matters of concern to achieve new understanding for reflexive intervention. This is important for noting how many matters of social-ecological concern are commonly beyond our immediate grasp without mediated depth enquiry that can open the way to a critical grasp for reflexive learning. Action research and community problem solving in environmental education and now social learning (Wals, 2011), have emerged as frameworks for collaborative processes of ESD, but key attributes for situated learning have not always been enabled for a co-engaged grasp that can purposefully drive reflexive learning and change.

The participatory action research and social learning expansions of ESD allows us to see how 'reflexive modernisation' after Ulrich Beck (2009) is emerging as diverse education processes that give rise to and enable ESD as *praxiological processes of dialectical reflexivity*. Here education beyond prevailing knowledge practices cannot be engaged in a vacuum but must develop out of the prevailing logic of practice as a transgressive process. Here also dialectical reflexivity has come to characterise the critical contours of the modern day where prevailing patterns of human conduct are producing risk.

Unfortunately, key aspects of these situated and action-centred processes of critical engagement and reflexive change have remained under-theorised in most ESD perspectives for competence-producing multi-stakeholder social learning. Recent work with Cultural-Historical Activity Theory (CHAT) is further expanding our grasp of ESD as reflexive learning borne of engagement with knowledge and the contradictions of the day within a co-mediated and expansive learning process to realise more sustainable alternatives (Mukute & Lotz-Sisitka, 2012). Here, new environmental systems knowledge can enable participants to transgress what is known and taken for granted and initiate local interventions to foster change. Situated and co-engaged intervention approaches such as this (for example Mukute, 2010; Masara, 2011; Lindley, 2014; and Kachilonda, 2014 - synthesised and reviewed in Lotz-Sisitka 2014) have been derived, understood and narrated in diverse ways across differing contexts where participants struggle with existing and emerging cultural historical tools in learning to grasp matters of concern and how these are being produced and reproduced as risk. These research projects are all pointing to the importance of *reframing* an expansive social learning that is *transgressive* and change oriented (Lotz-Sisitka, 2014). The research projects also show that this requires the introduction of new knowledge *juxtaposed with and/or brought into dialectical reflexive engagement* with existing knowledge and an experience of socio-historically situated risk. Through this, articulation of possibilities for social transformation and change can emerge (ibid.). The research shows too (ibid.) that this becomes possible via situated, formative and expansive learning processes as theorised by Engeström and his colleagues[6] working with cultural-historical activity theory and the expansion of human learning and activity. Stetsenko (2008) also working in the cultural historical activity theory tradition, but with a strong commitment to transformative agency and action, probes cultural, historical and relational processes that might enable us to mediate a situated, critical disposition for approaching learning to change as a reflexive process of working with existing and new environmental knowledge to engage emerging contradictions so that we can learn and change things together.

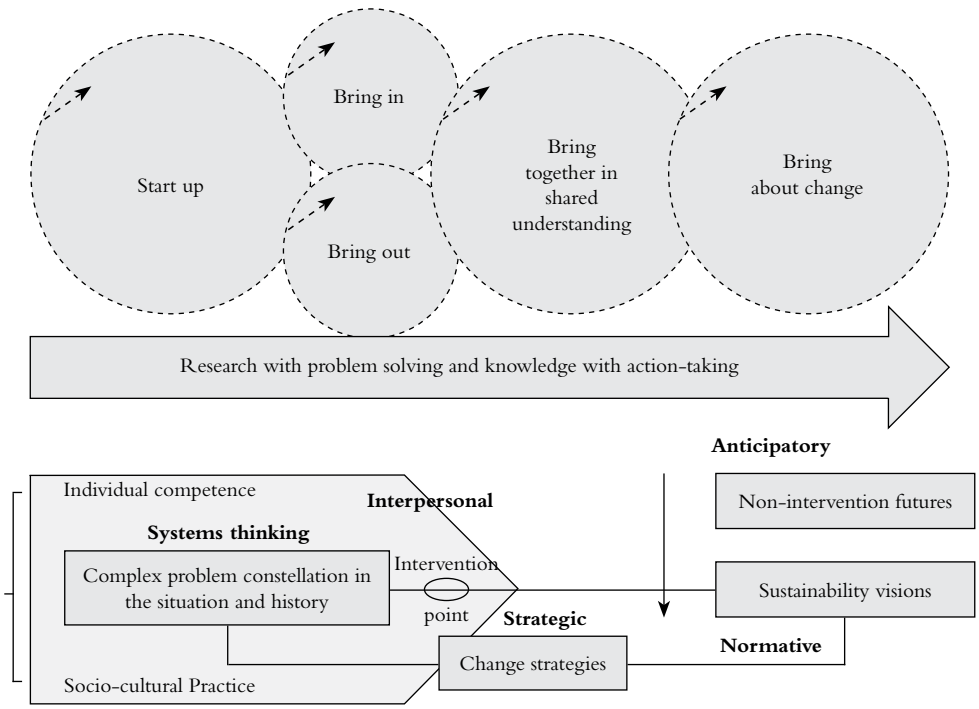
New Environmental Knowledge and Competence

Working with new environmental knowledge has not been an easy matter, particularly within individualising, constructivist dispositions that exemplify participation in its own right and on its own terms. Also, new environmental knowledge is not always accessible in the schooling system, particularly in many African contexts where new environmental knowledge is not widely available.[7] As noted above, discourses framing competence approaches to ESD have emerged as social imaginaries for producing a sustainable future. Within these discourses, conventional education practices have often been contrasted as inappropriate and failing against the new ideals. Competence frameworks have also been difficult to translate into the schooling system, commonly manifesting as somewhat arbitrary criteria that do not always produce coherent progressions in teaching and learning processes. Early competence frameworks did not have the coherence that one might have hoped for framing pedagogy to mediate social change in response to the social-ecological systems producing risk.

A useful refinement in competence modelling emerged through the work of Wiek, Withycombe and Redman (2011). Their contributions resolved some of the tensions and contradictions, providing insights on the importance of new environmental knowledge for *systems thinking* and other competences necessary (and emergent) in processes of learner-led research to inform and initiate action for change.

Figure 2 reflects how, according to Wiek *et al*. (2011), in complex problem constellations, new environmental knowledge and systems thinking can enable anticipatory competence and normative adjustment for sustainability visions. However this needs to be accompanied by the strategic and interpersonal competence to bring about the necessary change for a reflexive vision to be realised.

Figure 2. Translation of the Wiek *et al.* curriculum framework into a learning progression



This approach to competence framing in curriculum contexts has been useful for contemplating a new environmental systems knowledge start-up and a learning engagement that brings out heritage as well as bringing in what is now known so that participants can bring their ideas together into collaborative, strategic initiatives to bring about change. This open process is reflected in the interlocking progression of circles reflecting ESD as a process of research with problem solving and knowledge with action-taking.

Framing a Curriculum of Concepts and Competences for ESD in Japan

The expansive framing of competence as a developing process involving systems thinking and collaborative learning to change, and its clarification as social-ecological attributes that relate human actions with surrounding environments is useful for contemplating learning progressions for ESD. The National Institute for Education Policy Research in Japan (2010), for example, has framed an ESD curriculum where six key concepts are used to scope social-ecological attributes for building a sustainable society (Table 2). The curriculum process is centred on six core concepts and seven abilities and attitudes related to these social-ecological concepts being used to engage in developing a sustainable society.

Table 2. Six concepts and seven abilities and attitudes for building a sustainable society

Aim of the learning instruction from ESD viewpoints

Discovering issues on sustainable society-building and acquiring abilities and attitudes *necessary to solve the issues*

SIX CONCEPTS	SEVEN ABILITIES & ATTITUDES
1 Diversity	1 Critical thinking ability
2 Interdependence	2 Ability to predict future image for making plan
3 Limitation	3 Ability to think in multifaceted and comprehensive ways
4 Fairness	4 Ability to communicate
5 Cooperation	5 Attitude to cooperate with other people
6 Responsibility	6 Attitude to respect for connections
	7 Attitude to participate willingly

Source: NIER (2010), cited in Kadoya & Goto (2014).

The six concepts can be worked with in diverse ways to frame and mediate learning interactions and lesson sequences (NIER, 2010). This framing of an ESD curriculum process can be undertaken in ways that develop as an expansion of existing curriculum processes. The learning progressions can be developed around new environmental knowledge and systems thinking that are extended to questions of social justice and the importance for citizens to work together to find solutions to the intractable problems of our times.

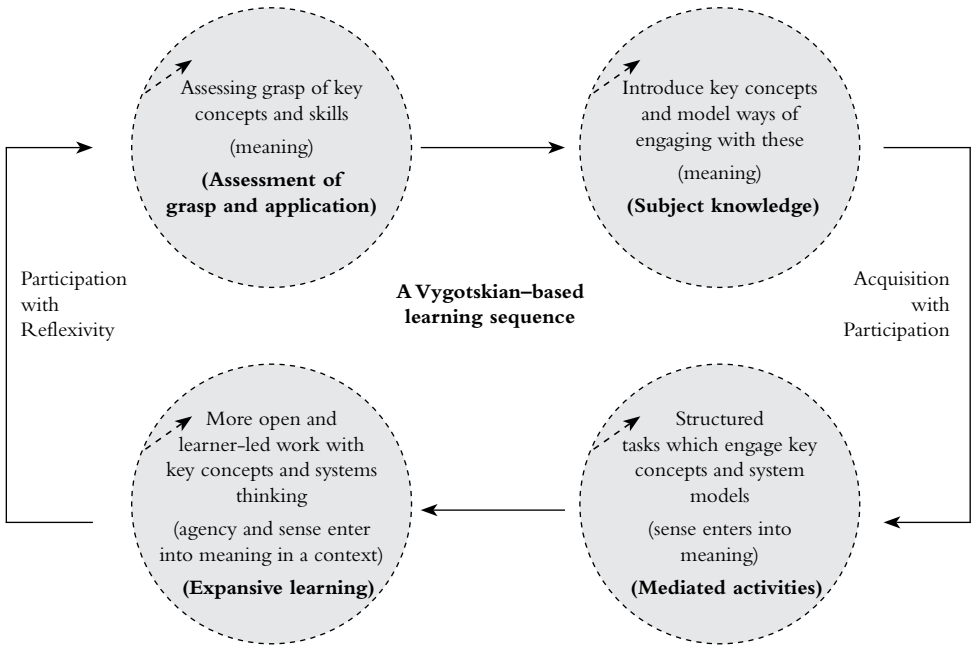
ESD as the Mediated Expansion of Knowledge-informed Learning Sequences

ESD perspectives are commonly set up in contrast to how teaching and learning is currently happening in many educational institutions. This is particularly notable in a vilifying of knowledge transmission approaches and authoritative perspectives over participatory and transformative ideals of citizens producing a sustainable future. Jickling and Wals (2008) for example, usefully criticise a deterministic framing of sustainable development in the early concept of ESD. Here the underlying propositions were primarily authoritative and transmissive and in contrast to emerging participative approaches that are thought to better enable transformative learning. This key point should not be confused with curriculum contexts where concepts and knowledge are communicated to enable learners to develop a grasp of complex ideas for learning. The critique was directed at getting beyond inscriptions in the concept of sustainable development and a failure to note that sustainability can be an unknown that might require a transgressive reframing of how we see and do things in a changing world. Jickling and Wals' (2008: 6) concern is thus: 'Enabling thought and action - Beyond sustainable development'. A superficial reading of their work has suggested that the transmission of knowledge and authoritative methodologies in schooling should be displaced by participative and socio-constructivist approaches. This matter is not easily resolved without reference to the work on curriculum and schooling by Anna Sfard (1998). She explored similar tensions and contradictions in schooling and has proposed that one needs an educative authority for acquisition of concepts for meaningful participation to be possible, and alongside this, one needs participation in order for acquisition to have relevance.

Anne Edwards (2014), working with a Vygotskian learning sequence (Figure 3), illustrates how good teaching appears to emerge through situated teaching for concept acquisition with a transition to more learner-led participation. Here, processes of reflexive critical deliberation (higher-order skills) are made possible by the acquisition of knowledge and attendant cognitive skills acquired through careful work with concepts and ways of working with these that shape meaningful learning.

Seen in critical relief, it is possible to illustrate how an emphasis on the individual and circulating knowledge (abstract generalisations) in ESD has led to a loss of cultural context and history necessary for learning with relevance. Here, also, a decline in the engagement with new environmental knowledge could be muting the emergence of the necessary systems thinking for reflexive social learning to steer change. The Vygotskian learning sequence after Edwards (2014) should be read with the Wals and Jickling (2008) critique of inscriptive approaches to sustainable development (structural functionalism). Sfard (1998) resolves the problem of a need for both acquisition for participation and participation for relevance in social learning as a process of cultural change towards future sustainability.

Figure 3. A lesson sequence with acquisition for participation with reflexivity (adapted from Edwards, 2014)



Concluding Synthesis for an Expanded ESD Framework and its Assessment

This review has briefly examined the expanding concept of ESD and a possible resolution of many of the contradictions it currently contains.

Tracing the modernist constitution of conservation, environment and sustainability education allows one to contemplate ESD as a process of *praxiological dialectical reflexivity and social change*[8] emerging in an expansive array of reflexive critical processes in a changing world. Clarifying how ESD comes to be situated and enacted as practices-centred and co-engaged social processes of learning-to-change has been beset with competing tensions and modes of assessment that have produced plural and often conflicting models of process that are not easily reconciled. The review has attempted to track and to navigate some of the contours of change as well as some of the dimensions of these that might be used to develop better framing tools for our continuing ESD work.

The narrative points to the need for more careful work with competence frameworks and for a review of many assumptions that have emerged where ESD has been posed as a participatory alternative to current practice. The review navigates an alternative route that approaches ESD as a situated process of co-engaged reflexive change within a transgressive expansion of existing education and social practices. The paper notes the importance of knowledge-informed learning sequences to enable better-situated knowledge acquisition that

enables higher-order critical and systems thinking in the contexts of both schooling and wider multi-stakeholder reflexive learning in a changing world.

Looking back at the journey thus far to contemplate the learning processes that appear to be needed for global citizens in an Anthrophocene of radical cultural adjustment, it is clear to me that there are no silver bullets nor a gold standard for the assessment of our work. Important remaining challenges include developing better understandings of **ESD as an assessment process.** Alongside this, one needs to give attention to enabling assessment in ESD processes as well as the assessment of ESD as a reflexive process of change (O'Donoghue & Fadeeva, 2014). It is thus noted that perspectives on learning and assessment need to be developed in context and be clarified to steer reflexive learning and change.

These realisations have steered the emerging narrative towards clarifying tools for better-situated and knowledge-informed learning sequences where competence might best emerge in and as multi-stakeholder processes of learning and change. Some of the framing tools for an expanded and a better-situated grasp of ESD as a transgressive process are becoming more clearly apparent out of the Nagoya review of the concept as outlined in this paper. This reflection should therefore be read as an orientating narrative for continued work in southern African where our education work is developing as open processes of situated co-engagement in knowledge-mediated learning and social innovation. Here, our ESD practices are emerging as transgressive processes of assessment and change, the value-producing dimensions of which will need clarification and reporting into and out of the diverse contexts of learning-to-change involved. With these framing tools to steer our continuing education work, I am optimistic that we might be able to maintain and reproduce more just and sustainable social-ecological systems for all that share in, contribute to and benefit as global communities of interdependent living things.

Expressions of optimism such as this are all very well but it remains to be seen if transgressive forms of education can gain sufficient traction for cultural processes of praxiological dialectical reflexivity (human conduct enquiry with deliberative re-imagining) to produce the reorientation necessary into the Anthropocene. Our continuing work on environment and sustainability matters of concern is probably to continue to ask the question, 'What co-engaged modes of educative engagement in relation to human conduct are producing the necessary transgressive change for the common good?'

Note on the Contributor

Rob O'Donoghue is an associate professor at the Environmental Education Research Centre, Rhodes University. He wrote this 'Think Piece' as a positioning paper on the emerging concept of ESD after co-convening a global workshop with the National Institute for Education Policy Research (NIER), Japan.

Endnotes

1. I use this term in preference to 'transformation', following a conversation with my colleague Heila Sisitka who noted that the change required is often a transgressive move of re-imagining departure from conventional wisdom (Lotz-Sisitka, 2014).
2. In 1990 UNESCO, UNDP, UNICEF and the World Bank were present at a round table to address, 'Environmental Education: A component of sustainable development.' Here Hungerford and Volk, in the conventions of the time, argued for an issue-based approach where, 'The ultimate aim of education is shaping human behavior' (Hungerford & Volk, 1990: 257).
3. Notable here is how circulating knowledge in relation to biodiversity, climate change, obesity and social justice, for example, has proliferated with the advent of electronic media.
4. Although framed for teacher education, the competences reflect ESD as a collaborative pedagogical process, noting, '*Transformative pedagogy'* draws on the experience of learners and creates opportunities for participation and for the development of creativity, innovation and the capacity to imagine alternative ways of living. (UNECE, 2011: 7)
5. The *gelesha* of the pre-colonial Xhosa is a good example of adaptive competence to optimize water infiltration for summer cropping in anticipation of an extended winter drought as is currently becoming apparent with climate change.
6. See Engeström and Sannino (2010) for a recent synthesis of this work.
7. This is due mainly to research systems that are inadequately set up and prepared for the scale, scope and type of knowledge production necessary (see www.sarua.org for an analysis of this in the climate change context in southern Africa).
8. This proposition is useful for analytical traction on how education emerged as a process of reflexive modernisation in recent times of rapid change and escalating risk.

References

Adelman, C. (1993). Kurt Lewin and the origins of Action Research, *Educational Action Research*, 1(1), 7–24.

Ahmedabad Declaration (2007). A call for action. *Journal of Sustainable Development*, 2(1), 87–88.

Alcock, I. (2012). Measuring commitment to environmental sustainability: The development of valid and reliable measure. Methodological Innovation Online, 7(2) 13–26.

Beck, U. (2009). Critical theory of world risk society: A cosmopolitan vision. *Constellations*, 16(1), 3–22.

Bhaskar, R. (1993). *Dialectic: The pulse of freedom*. London: Verso.

Courtenay-Hall, P. & Rogers, L. (2002). Gaps in mind: Problems in environmental knowledge-behaviour modelling research. *Environmental Education Research,* 8(3).

De Haan, G. (2010). The development of ESD-related competencies in supportive institutional frameworks. *International Review of Education*, 56, 315–328.

DST/NRF (Department of Science and Technology/National Research Foundation) (2010). *Ten Year Innovation Plan*. Pretoria: Ministry of Science and Technology.

Edwards, A. (2014). Designing tasks which engage learners with knowledge. In Thompson, I. (ed.), *Task design, subject pedagogy and student engagement*. London: Routledge.

Engeström, Y. & Sannino, A. (2010). Studies of expansive learning: Foundations, findings and future challenges. *Educational Research Review*, doi:10.1016/j.edurev.2009.12.002.

Hollweg, K. S., Taylor, J. R., Bybee, R. W., Marcinkowski, T. J., McBeth, W. C. & Zoido, P. (2011). *Developing a framework for assessing environmental literacy*. Washington, DC: North American Association for Environmental Education. Available at http://www.naaee.net.

Hungerford, H.R. & Volk, T.L. (1990). Changing learner behaviour through environmental education. *Journal of Environmental Education*, 21(3), 8–21.

Jickling, B. & Wals, A. (2008). Globalisation and environmental education: Looking beyond sustainable development. *Journal of Curriculum Studies*, 40(1), 1–21.

Kadoya, S. & Goto, M. (2013). *Transitioning towards ESD: A steady progression or a paradigm shift?* Tokyo: National Institute for Education Policy Research (NIER).

Latour, B. (2004). *Politics of nature: How to bring the sciences into democracy*. Cambridge, MA: Harvard University Press.

Lotz-Sisitka, H. (2014). Transgressive Learning in the Anthropocene. Agency from below. Paper presented at the 20th anniversary of the Centre for Research into Activity Development and Learning, University of Helsinki, Helsinki, September 2014. Environmental Learning Research Centre, Rhodes University, Grahamstown.

Maruyama, H. (2010). Social competence: A learning outcome of policy and school practice in Education for Sustainable Development in Japan. *International Journal of Educational Policies*, 4(2), 5–18.

Mukute, M. & Lotz-Sisitka, H. (2012). Working with cultural-historical activity theory and critical realism to investigate and expand farmer learning in southern Africa. *Mind, Culture and Activity*. 19(4), 342–367.

Moore, J, (2012). Social and behavioural aspects of climate change: Ireland's climate change challenge: Final Report of the NESC Secretariat: Connecting 'How much' with 'How To'. Ireland, National Economic and Social Council, December, 2012.

NIER (National Institute for Educational Policy Research). (2010). *Education for Sustainable Development in Japan*. Tokyo: NIER.

Neumayer, E. (2003). *Weak versus strong sustainability: exploring the limits of two opposing paradigms* (second edition). Cheltenham: Edward Elgar.

O'Donoghue, R.B. (1999). Participation: An under theorised icon in research and curriculum development. *Southern African Journal of Environmental Education*, 19, 14–27.

O' Donoghue, R. (2007). Environment and sustainability education in a changing South Africa: A critical historical analysis of outline schemes for defining and guiding learning interactions. *Southern African Journal of Environmental Education (Special Edition),* 24, 141–157.

O'Donoghue, R. Shava, S. & Zazu, C. (2013). *African heritage knowledge in the context of social innovation*. Tokyo: United Nations University Institute for Advanced Studies (UNU-IAS).

O'Donoghue, R. (2014). ESD and the framing of transformative social learning in RCEs. In Fadeeva, Z. Payyappallimana, U. Chhokar, K. (eds), *Building a resilient future through multi-*

stakeholder learning and action: Ten years of regional centres of expertise on education for sustainable development. Tokyo: UNU-IAS.

O'Donoghue R. & Fadeeva, Z. (2014). Enhancing monitoring and evaluation practices in RCEs. In Fadeeva, Z. Payyappallimana, U. Chhokar, K. (eds), *Building a resilient future through multi-stakeholder learning and action: Ten years of regional centres of expertise on education for sustainable development*. Tokyo: UNU-IAS.

Planet Under Pressure (2012). State of the Planet Declaration: New Knowledge towards Solutions. London, 29 March 2012.

Popkewitz, T. (2008a). *Cosmopolitanism and the age of school reform: Science, education, and making society by making the child*. London & New York: Routledge.

Popkewitz, T. (2008b). Education sciences, schooling and abjection: Recognising difference and the making of inequality? *South African Journal of Education*, 28, 301–319.

Rabinow. P. (2003). *Antropos today: Reflections on modern equipment*. Princeton, NJ: Princeton University Press.

Rathouse, K. (2008). *Environmental Action Fund project evaluations: Good practice handbook*. London: Department for Environment, Food and Rural Affairs.

Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. *Education Researcher*, 27(2), 4–13.

Steffen, P., Crutzen, P. & McNeill, J. (2007). The Anthropocene: Are humans now overwhelming the great forces of nature? *Ambio*, 36(8), 614–621.

Stetsenko, A. (2008). From relational ontology to transformative activist stance on development and learning: Expanding Vygotsky's (CHAT) project. *Cultural Studies of Science Education* 3(2), 471–491.

UN (United Nations). (1987). Our common future: Report of the World Commission on Environment and Development. Nairobi, 14th Session, 8–19 June 1987.

UNECE (United Nations Economic Commission for Europe). (2011). *Learning for the Future: Competences in Education for Sustainable Development*. Geneva: UNECE.

UNESCO. (1996). Learning: The treasure within. Report to UNESCO of the International Commission on Education for the 21st century. Paris: UNESCO.

UNESCO. (2014). Shaping the future we want: UN Decade of Education for Sustainable Development (2005–2014), Final Report. Paris: UNESCO.

UNU-IAS (United Nations University Institute for Advanced Studies). (2014). *Building a resilient future through multi-stakeholder learning and action: Ten years of RCEs on Education for Sustainable Development*. Tokyo: UNU-IAS.

Vygotsky, L. (1978). *Mind in society*. London: Harvard University Press.

Wals, A. (2011). Learning our way to sustainability. *Journal of Education for Sustainable Development*, 5(2), 177–186.

Wals, A., Brody, M., Dillon, J. & Stevenson, R. (2014). Convergence between science and environmental education. *Science,* 344, 583–584.

Wiek, A., Withycombe, L. & Redman, C. (2011). Key competencies in sustainability: a reference framework for academic program development. *Sustain Sci*, DOI 10.1007/s11625-011-0132-6.