Learning our way forward and how we might assess that

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Abstract

This chapter explores the question of learning outcomes and their assessment in the context of education for sustainable development (ESD). Starting with a brief review of different dimensions of ESD, approaches to curriculum planning and purposes of assessment, the chapter turns to the current tendency to focus on competences, what has been described as the Competence Turn. After looking at the rationale for this focus, the chapter presents an example of a competence framework for educators of sustainable development developed by a European-funded project, *A Rounder Sense of Purpose*. The chapter goes on to explore the question is assessment in more detail making the distinction between assessment *of*, *for* and *as* ESD. The latter is exemplified by assessment of experiential learning linked to the Arts, outdoor education and pupil-led community projects. The chapter concludes by highlighting how meaningful assessment of ESD is only likely to be achieved when rigid school structures shift in response to the need for education to broaden its purpose to embrace sustainability.

Keywords: Competences; education for sustainable development; assessment; purpose of education; RSP.

Introduction

Everywhere we turn we are beset with intractable social and environmental problems that threaten the very habitability of the Earth. Having got ourselves into this situation, we now face the urgent task of learning our way through, if not out of it.

Education may assist us in preparing the next generation to recognise the fundamental flaws in our concepts of development; however, this has not been education's central role hitherto. As Schumacher puts it, in that oft-cited quotation, "If still more education is to save us, it would have to be education of a different kind." (Sterling 2001, p. 21). Education for sustainable development (ESD) is widely seen by its proponents as the different kind of education that Schumacher had in mind. Yet when it comes to assessment we seem to return to old habits, as if forgetting that education wasn't going to be like this. In this chapter, I wish to share something of my own understanding of ESD and explore one particular strand of its development, which I call the Competence Turn. After a brief explanation of one example of an ESD competence framework, I turn to the question of assessment in ESD – an aspect that highlights the difference (or lack thereof) between ESD and mainstream education.

The very phrase education *for* sustainable development (ESD) is fraught with tensions. On the one hand, we want ESD to be distinct from 'mainstream' education, to make a difference in terms of its impact on our learners and society. Yet on the other hand, most teachers I've met would wish to expand young people's horizons and offer them choices in life, not sell them a set of prescribed, 'correct' behaviours.

One way of navigating this double bind is by seeing ESD as a combination of two approaches (Vare and Scott 2007), each underpinned by its own philosophy:

> ESD 1: promoting/facilitating changes in what we do including promoting (informed, skilled) behaviours and ways of thinking, where the need for this is clearly identified and agreed – this is learning *for* sustainable development.

ESD 2: building capacity to think critically about (and beyond) what experts say and to test sustainable development ideas including exploring the contradictions inherent in sustainable living – this is learning *as* sustainable development.

The first approach comes with a definable body of knowledge, albeit subject to rapid change, as such it can be aligned closely with what Kelly (2009) terms *curriculum as content*. The second approach is more complex, it requires facilitation rather than direct instruction and calls for a high degree of sensitivity in order to contribute to a transformation in how learners understand their position or possibilities within their own context. This reflects a co-created approach to curriculum that Kelly (*Ibid*) terms *curriculum as process.* By combining ESD 1 and ESD 2, it is hoped that we might produce agents of change who are both informed and critical and who, simultaneously (a) are aware of – and skilled in – a range of possible actions and (b) can discern which of these, if any, would be most appropriate for them to take, given their current situation. The phrase 'produce agents' indicates another item from Kelly's typology of curriculum approaches, that is, *curriculum as product*.

Curriculum as product focuses on the outcomes of education, e.g. what the leaner knows or can do, rather than specific curriculum content or even pedagogical concerns. In this regard, it lends itself to the identification of measurable outcomes; this is one reason for its popularity, particularly in the form of competence-based learning.

The Competence Turn

According to Hodge (2007), competency[1]-based education and training (CBET) became popular initially in the USA in the late 1950s as a means of holding teachers and teacher educators accountable. This in turn was a response to perceived deficits in education highlighted by the USA's falling behind the USSR in the space race. This approach views processes as predictable and manageable, it also fits well with behaviourism, which was the dominant theory of learning at the time (Shephard in press). The way in which this approach lends itself to measurable verification with apparent ease resonates with the all-pervasive managerialism that has come to characterise national education systems in the wake of neoliberal policy environments that have become a global phenomenon since the 1980s (Harvey 2005). Indeed, outcomes are now "used as criteria for the productivity of entire educational systems" (Klieme *et al*. 2008, p.3).

Naturally this approach found its way into environmental education with the publication of a set of 'competencies' for teachers as part of the International Environmental Education Programme (IEEP) series of 'green books' (Wilke, *et al*. 1987). This was significant because it was aimed at educators rather than the population as a whole. Broader sets of competences for learners include those defined by the Paris-based Organisation for Economic Cooperation Development (OECD) under its *Definition and Selection of Competencies* (DeSeCo) project, which aimed to identify the competencies necessary for individuals to confront the challenges of balancing economic growth with environmental sustainability and social equity (OECD 2002). This work provides the foundation of the *OECD Learning Compass 2030*, a project that aims to identify 'transformative competencies' for young people (Rychen 2019). A set of key competencies in sustainability, developed originally as learning outcomes of sustainability science students (Wiek *et al.* 2011) has become highly influential and was used as a basis for UNESCO's key competencies in education for sustainable development (Rieckmann 2018) and a recent international Delphi Study on key competencies in sustainability (Brundiers *et al.* 2021).

[1] I draw no distinction between these terms here and I use whichever form is used by cited authors and publications. For a discussion on the difference between 'competence' and 'competency' see the Introduction to Vare *et al* (in press).

Meanwhile in 2005, the United Nations Economic Commission for Europe (UNECE) published its Strategy for Education for Sustainable Development that called on Member States to "develop the competence within the education sector to engage in ESD" (UNECE 2009, p.21). The international organisation ENSI (Environment and School Initiatives) answered this call with its CSCT model, i.e. **C**urriculum, **S**ustainable development, **C**ompetences, **T**eacher training (Sleurs 2008). This was followed by a framework of 39 ESD competences for educators developed by a UNECE expert group (UNECE 2012).

The Competence Turn in ESD has since provided us with some potentially useful, research-informed frameworks of educator competences for sustainability including the KOM-BiNE model (Rauch and Steiner 2013), the work of Bertschy *et al.* (2013), A Rounder Sense of Purpose (Vare *et al.* 2019) and the work of Timm and Barth (2021).

A Rounder Sense of Purpose

At this point it may be helpful to reveal the contents of one of these competence frameworks and given my close involvement with one of them – A Rounder Sense of Purpose, or RSP (Vare *et al*, 2019) – I will briefly explain the rationale behind it. The idea came initially from some of us who had been involved in the UNECE process as we were unhappy with the large number of competences in that framework, which teachers themselves were finding unwieldy. RSP sought to distil the UNECE competences into a tighter framework with carefully defined learning outcomes and materials to support the development of the competences among educators and student teachers. All of this is available on the RSP website at: https://aroundersenseofpurpose.eu

Thinking Holistically	Envisioning Change	Achieving Transformation
Systems The educator helps learners to develop an understanding of the world as an interconnected whole and to look for connections across our social and natural environment and consider the consequences of actions.	**Futures** The educator helps learners to explore alternative possibilities for the future and to use these to consider how behaviours might need to change.	**Participation** The educator helps learners to contribute to changes that will support sustainable development.
Attentiveness The educator helps learners to understand fundamentally unsustainable aspects of our society and the way it is developing and increases their awareness of the urgent need for change.	**Empathy** The educator helps learners to respond to their feelings and emotions and those of others as well as developing an emotional connection to the natural world.	**Values** The educator develops an awareness among learners of how beliefs and values underpin actions and how values need to be negotiated and reconciled.
Transdisciplinarity The educator helps learners to act collaboratively both within and outside of their own discipline, role, perspectives and values.	**Creativity** The educator encourages creative thinking and flexibility within their learners.	**Action** The educator helps the learners to take action in a proactive and considered manner.
Criticality The educator helps learners to evaluate critically the relevance and reliability of assertions, sources, models and theories.	**Responsibility** The educator helps learners to reflect on their own actions, act transparently and to accept personal responsibility for their work.	**Decisiveness** The educator helps the learners to act in a cautious and timely manner even in situations of uncertainty.

Table 1: The Rounder Sense of Purpose Framework

The result is a framework of twelve competences (Table 1), each with three learning outcomes and a number of underpinning components plus a bank of activities that are linked to the UN Sustainable Development Goals as well as each of the twelve RSP competences.

Although RSP uses the language of competences, the framework's name belies its broader intention, that is to question the current narrow purpose of formal education as it is understood in policies that focus on its (albeit important) economic value[2]. The name of RSP thus represents a deliberate challenge to the whole notion of reducing education to sets of competences; the reason the term 'competence' was used at all was to help the project to engage readily with current debates, to indicate the provenance of the framework and to find favour with potential donors who would recognise this term given its current ubiquity.

Most of the teaching activities on the RSP website reflect a constructivist pedagogy that allows and encourages learners to build on what they already know. Many of the activities are exploratory, discursive and invite creativity of thought, in this way they reflect an ESD 2 approach. They also include steps that call upon learners to conduct their own research thereby adding to their knowledge base in situations where they are overseen by the educator who can guide, pose questions and highlight mis-conceptions. Thus ESD 1 is also built in to the activities.

One serious hazard of taking a competence-based approach to ESD lies in the very reason that competences are so popular; that is, they define pre-determined learning outcomes. This presents a double bind: to put competences into practice they need to be context bound and have specific outcomes, yet ESD is characterised by the need to prepare young people to engage in transforming our current unsustainable context. Educators for sustainability recognise that our best hope lies in educating citizens to be open to unforeseen conditions, to learn our way forward into an unknowable future. If our pedagogy is to be aligned with this purpose, how can it be focused on steering our learners towards carefully prescribed 'correct' solutions?

Taking this need for flexibility and creativity into account, the RSP competences are presented in the form of an artist's palette[3]. This invites the educator to combine the competences in ways that are unique to their context reflecting who they and their learners are in any given time and place. In this way the palette offers an emergent rather than a linear approach, suggesting that each learning episode will have its own unforeseen outcomes, which brings us to the question of assessment.

We did not to break down the twelve RSP competence areas into skills, values, knowledge and so forth because this would atomise learning into discrete components; this would undermine the notion of holistic thinking that characterises sustainable development. Such an approach would render the individual components meaningless, a point well made by Westera (2010), who critiques the tendency to break down components of competences, such as skills:

> Consequently, the entanglement of the skills-hierarchy and the competence-hierarchy produces a complex, confusing and inconsistent conceptual system that cannot be taken seriously. (*Ibid*, p. 85)

In response to this issue, some RSP partners have chosen to focus on quality criteria[4] and avoid the issue of measurement altogether. The RSP framework is not accompanied by a single proposal for assessment, rather it recognises that assessment will need to be diverse and potentially quite complex if it is to be aligned with the subject matter of sustainable development itself. In the UK we have used

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[2] A striking example of this can be found in the UK where the Government's *Projected Completion and Employment from Entrant Data* (Proceed) records the nature of jobs (and income) secured by higher education alumni and uses this as a key measure of the 'quality' of education offered by each institution.

[3] https://aroundersenseofpurpose.eu/framework/palette

[4] This approach reflects that taken in the past by ENSI, see: Breiting *et al*. (2005).

a combination of approaches discussed below. What follows is my attempt to tease out some of the key issues for consideration when thinking about assessing ESD.

Purposes of assessment

Before exploring how assessment might be conducted, we should first clarify why we wish to do it at all. Summative assessment *of* learning is carried out after a programme of study. It generally attracts most attention because it is used to judge students' final level of achievement and is of interest to stakeholders beyond the school. In the face of this dominant mode of assessment, seminal work by Black & Wiliam (1998) highlighted how formative assessment, i.e. a form of assessment *for* learning, has been shown to generate significant learning gains among students. A natural progression of this approach has been to involve students in their own assessment, building their skills, knowledge and predisposition for learning in the process – this is assessment *as* learning.

These three approaches can in turn be mapped against different *purposes* of assessment; Boyd & Bloxham (2007) identify four purposes:

1. *Certification* – a means of qualifying a learner by recognising their level of achievement; also used to discriminate between students. This is assessment *of* learning.

2. *Student learning* – "promoting learning by motivating students, steering their approach to learning and giving the teacher useful information to inform changes in teaching strategies." (*Ibid*, p. 31). This is assessment *for* learning and can also be assessment *as* learning.

3. *Quality assurance* – often an external function or an internal moderation to check the validity and consistency of assessment. Very much assessment *of* learning.

4. *Lifelong learning capacity* – using assessment to develop learners' broad capabilities (or competence) to continue with their own learning in the longer term. A form of assessment *as* learning.

From an ESD perspective, we may wish to emphasise assessment *as* learning because this represents a form of learning to learn, what we might call sustainable learning, it is thus aligned constructively with the aims of learning for sustainability. However, assessment *as* learning simply isn't the norm in mainstream schools and requires practice on the part of the learners as well as the educators (Kostons *et al.* 2012). Against this concern, we should recall that ESD is supposed to be 'education of a different kind' so the idea that assessment *as* learning is not widespread should encourage us to emphasise this approach. On the other hand, if ESD is to become embedded in the core business of schools, then it will need to cover all of the purposes outlined above, including their related use of assessment *of* learning. All of which highlights the fact that there is no 'silver bullet' by which we can solve the assessment question.

Means of assessment in ESD

There is no clear consensus on how ESD relates to its forebearer, environmental education (Sterling 2010), which can only add to the confusion about what ESD actually is. It is little wonder therefore, that there is no clear framework for how to assess it. Given that sustainability itself is concerned with addressing 'wicked' problems for which there are no clear-cut solutions, education in this context would do well to reflect this complexity. This means that it cannot consist entirely of predetermined procedures with clearly measurable outcomes. Rather than focusing on expected results, as high

stakes assessment procedures tend to do, our assessment of ESD will need to embrace unexpected, emerging and unintended outcomes.

In such cases, *measurement* is not a particularly helpful concept. Rather than attempting to quantify these things, we will need to be concerned with quality, both of the outcomes and of the thinking that led to them. This requires us to define quality criteria against which to assess ESD (Breiting *et al.* 2005) using indicators derived from those criteria. This opens the way for dimensions such as participation, empathy or congruence with sustainability principles (e.g. equity, positive environmental impact) to be included in the assessment regime.

With ESD goals being so broad and far reaching, meaningful assessment has always been a challenge and so attempts have tended to be piecemeal. Currently, specific information on which tools are best for yielding evidence for different aspects of ESD is dispersed across the literature so more work is required to bring this together. One promising development has come in the form of a systematic literature review covering research on assessing competences in sustainability (Redman *et al.*, 2021); this identifies eight distinct types of tools:

- scaled self-assessment
- reflective writing
- scenario/case test
- focus group/interview
- performance observation
- concept mapping
- conventional test
- regular course work.

These in turn fall into one of three broad categories or meta-types of assessment procedure:

(i) self-perceiving-based
(ii) observation-based
(iii) test-based.

This provides a useful framework for gathering together future research; it can also offer a menu from which practitioners can select the most appropriate tools for their purposes. Interestingly, the study by Redman *et al.* (2021) reveals that the most frequently used tool (occurring in over half of all studies reviewed) is scaled self-assessment. While this may be an effective form of assessment *for* learning, it has limited value as a means of providing assessment *of* learning given that individuals cannot be expected to grade themselves for external certification purposes. The key therefore, is to marshal a range of assessment approaches in order to provide a multi-dimensional picture of the attributes that we are attempting to assess.

Assessment *of*, *for* and *as* ESD

The search for clear, simple assessment procedures is understandable; that is how our education systems work. They teach facts and impart skills that students are expected to repeat, manipulate or demonstrate depending on the sophistication of the assessment tool. This, however, is unlikely to be the best preparation for the kind of adaptable, self-directed learner that will be required as environmental conditions become more challenging over the 21st Century. Fortunately, as a result of the Competence Turn, there is already some consensus on the likely learning outcomes that a more sustainable future will demand (Rychen 2019; Wiek *et al.* 2011; Rieckmann 2018; Brundiers *et al.* 2021). The task before us is to link the range (and it will need to be a wide range) of available assessment tools to those outcomes. It is beyond the scope of this chapter, or indeed any one

publication at present, to propose a 'best fit' set of procedures from the myriad possibilities. What I will leave you with is a few thoughts that take us beyond the most widespread approaches to assessment that are familiar in virtually every school. The terms of assessment *of*, *for* and *as* learning introduced earlier will help us here, only this time they are *of*, *for* and *as* learning for sustainability.

Assessment of and for ESD

In my own professional context, working in a higher education institution, students are required to demonstrate predetermined learning outcomes linked to a specific academic standard. Assessment in such a context is unlikely to reflect the complexity discussed above but it can offer opportunities to assess whether learning *about* and *for* sustainability has taken place. Over the course of four years of offering non-accredited courses we have developed an assessment approach that is now used on an accredited programme for student teachers.

By reviewing students' reflective journals we identified nine aspects of learning that could be grouped under the three broad headings of Understanding, Action and Reflection. Within these, students report on how they have reflected on or applied their learning in their professional, social and/or private life, including where they have sought to develop sustainability learning or competences in others.

On this particular programme, the predetermined learning outcomes are linked to the twelve Rounder Sense of Purpose (RSP) competences. Seeking evidence of all nine learning aspects for each of the twelve competences would sacrifice depth of engagement for breadth of coverage so we have defined a meaningful indicator of the *extent* of a student's learning to be: where the student can provide evidence of at least four of the nine learning aspects under each competence, with at least one in each category (Understanding, Action & Reflection). We also seek evidence of each of the nine aspects in at least four competences.

To assess a student's *depth* of engagement we analysed students' reflective journals and arrived at a series of exemplar statements that allowed us to construct a marking grid similar to those used on other university courses. The marker simply has to shade the descriptors that best describe the student's performance on a range of dimensions, such as presentation, criticality or use of literature, in order to build up a composite picture that helps them to define the appropriate grade to award the student. The actual work assessed can take the form of reflective journals, videos and formal essays. The critical feature of this approach is that it combines quantity with quality and can cover a wide range of evidence.

Despite this mixed methods approach, assessing learning outcomes in this way can lend itself to a linear model of education and can valorise weak forms of ESD that are unlikely to bring about much needed change. While we have witnessed our students undergoing transformative experiences, this has had little to do with their assessment. Yet transformative learning that might inspire learners to become agentic actors for change (Jickling and Sterling 2017) is what is required if we are to respond to the complex and rapidly changing crises that face us all. I therefore turn to three examples where learning and assessment are integral to the learning process and fully aligned to familiar attributes of learning for sustainability.

Assessment as (transformative) ESD

The grim reality of our situation in relation to environmental overshoot is often discussed in relation to scientific evidence (Bendell 2018); this can be difficult to face both conceptually and emotionally. Engaging learners in feeling and sensing as well as understanding, can play a crucial role in making concepts such as sustainability less distant or abstract (Jickling *et al*. 2017). Faced with complex, dynamic systems, ESD that focuses on experiential learning can provide learners with opportunities to combine different ways of knowing and valuing reality. Seeing the world anew in this way has a

critical part to play in contributing to transformational learning (Dieleman & Huising 2006; Sipos *et al.* 2008). The Arts have a crucial role to play here. Their appeal to the senses, the way they can combine embodiment, cognition and intuition, their openness to the unexpected, their playfulness, all provide fertile ground for encountering sustainability issues afresh. This suggests that the Arts have a transformative potential that can be tapped by educators willing to engage in the mystery and open-ended nature of aesthetic experience.

Following a two-week workshop with artists and scientists at the Universitat Oberta de Catalunya (Barcelona, Spain), in which Maria Heras (pers. comm.) worked with colleagues to create a science-based performance installation, the teaching team turned to the question of assessment. This is still under development but Heras and colleagues are looking at the co-creation process involved in the artistic endeavour *and* at the impact on the audience. This is not the stuff of marking grids or prescribed learning outcomes, rather it suggests an immersive process in which learners and other stakeholders are changed. The significance of this example is not so much the specifics of the assessment but the way in which the artistic process is framed as a form of knowledge in itself rather than as learning tool distinct from some independent message to be conveyed. Indeed, Østergaard (2019) warns us against seeing Art in an instrumental sense as it can quickly lose its potential for transformation if it is used in that way.

This tendency to reduce the potential power of a pedagogical approach by using it in an instrumental manner is often observed in the context of outdoor education. Without due attention being paid to the possibility of transformation, Lausselet & Zosso (forthcoming) suggest that outdoor education, while beneficial as a counterweight to classroom-based learning, can fail to achieve its potential in relation to ESD and remain a non-transformative example of say, Environmental Studies. The relationship between transformation, outdoor education and student learning is under researched at present (Hill & Brown 2014) but Lausselet & Zosso (*Ibid*) have shown that the potential is there if students can engage in real world issues where the political dimension is foregrounded and interact with stakeholders. In this way students do not simply learn about a place or an issue, they become a part of the story themselves.

Outdoor education provides opportunities to work with multiple forms of knowledge and each student is likely to gain from the experience in ways that are different to their peers so assessment will need to focus on the unforeseen and multi-dimensional outcomes that result from this engagement. This multiplicity of unforeseen outcomes could be embraced by constructing a meaningful framework of quality criteria in which to locate them.

Lastly, pupil-led community projects can also provide powerful and immersive experiences for pupils of all ages. A study of the impacts of such projects on secondary school pupils (Vare 2021) identifies three broad categories of activity that contribute significantly to the projects' impacts, these are: (i) making connections, (ii) taking action and (iii) engaging in planning. These three characteristics of the student learning emerged from interviews and workshops with the students and their teachers rather than being assessed explicitly. The assessment that did take place took the form of group presentations that allowed teachers to assess the quality of the students' logic in claiming that their project would have a positive impact within their communities. The presentations also, *inter alia*, revealed the strength (or otherwise) of community relationships, the quality of planning and the nature of the actions taken. Armed with the three-point framework (or quality criteria) above, a more structured assessment will be possible in future.

All three of these examples, the Arts, outdoor education and pupil-led community projects, point to ways in which assessment of ESD *per se* might be achieved as well as assessment of a specific discipline. The examples illustrate the importance of working across disciplines including in trans-disciplinary ways, i.e. working with stakeholders from beyond academia. Meadows (2008) reminds us

that reductionist thinking remains vital as we will always need discipline-based expertise but sustainability also demands that we look beyond this tight academic framing, indeed for some, the whole notion of disciplines can be unhelpful:

> "The notion of *un-disciplinarity* has been developed within the context of political ecology and environmental arts and humanities, which highlight how knowledge is created and reproduced within disciplines is inadequate to address the ecological challenges our societies are facing today." (Saratsi *et al.* 2019, p.19, italics in original)

This implies that the current structures of schooling are likely to be inadequate for transformative ESD to take place in a widespread manner. Efforts to re-think schooling litter the history of education but that may be because education has served its purpose very well in an era when that purpose was to inculcate the next generation into the logic (and roles) of the dominant society. Now that we can see just how unsustainable that society has become, surely it is time to re-think the structures that helped to create it – and this time, we might give serious consideration to assessment from the outset.

Concluding thoughts

If the goal of ESD is transformation, then it seems inevitable that experiential learning is going to have a large part to play – not forgetting that a lecture or reading a book can also be a transformative experience. Exploring the cognitive, physical *and* affective impacts of experience is therefore likely to play a significant role in the assessment of ESD. No single approach can hope to capture the multiple dimensions of this learning, which will include, for example, gains in knowledge, skills, connections, self-confidence and agency. If it is difficult to conceive of how this might sit within the education systems that we have today, then perhaps it really is time for that 'education of a different kind' together with a different kind of assessment. As we can see, this will be complicated, but rather than looking for ready answers, we would do well to 'stay with the trouble' as Haraway (2015) puts it, remaining open to the complexity of our situation and the multiple possibilities that this affords.

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