Beyond the ‘green bling’: identifying contradictions encountered in school sustainability programmes and teachers’ responses to them

Paul Vare
University of Gloucestershire

Corresponding author email: pvare@glos.ac.uk

Abstract

As schools seek to implement frameworks of education for sustainable development it is inevitable that they will encounter contradictions between their own aspirations and external demands. To analyse these contradictions through the lens of teachers-in-context, this research uses Cultural-historical Activity Theory that views schools as activity systems and reveals contradictions within those systems. Interviews with teachers and headteachers from a sample of twelve schools (primary, middle and secondary level) in England highlight contradictions that occur at different strategic levels in the school. A perspective document, comprising contradictory statements gathered from interview transcripts, reveals the extent to which these contradictions are shared among interviewees. A striking feature of the data is that teachers do not recognise these contradictions themselves. Analysis of the data reveals how teachers respond to contradictory situations. Responses include a sense of powerlessness, varying degrees of accommodation and a reframing of contradictions through ‘expansive learning’. This paper proposes a process for identifying and assessing contradictions in schools and suggests that, by making their responses to contradictions explicit, teachers can present learners with authentic examples of contextualised learning.

Keywords: education for sustainable development; Activity Theory; contradictions; teachers; schools

Introduction

Decades of international declarations and strategies (UNESCO-UNEP 1978; UNECE 2005; UNESCO 2004, 2014, 2017) have restated global aspirations for environmental education and/or education for sustainable development (hereinafter termed EE/ESD). The need for this continuous reaffirmation suggests that such aspirations may not be readily translatable into practice within schools. There will be many reasons for this. Schools are generally formal institutions, often with rigid curricula and examination pressures, they also have a responsibility for the immediate safety and security of pupils in their care, which can militate against encounters beyond the classroom. Given these pressures it is unsurprising that Sauvé (2017) identifies a persistent gap between schools and meaningful, contextualised learning opportunities.

Bearing in mind that sustainable development itself is a learning process (Sterling 2001; Vare & Scott 2007; Foster 2008; Wals 2017) and that barriers and contradictions can be prerequisites to learning (Jickling & Wals 2008), an exploration of the contradictions inherent in pursuing EE/ESD in schools could have as much value for the learning opportunities that it reveals as for the challenges that it exposes. This paper sets out to identify the contradictions that occur when attempting to implement EE/ESD in schools and, in the process, understand how teachers respond to the challenges or dilemmas that these contradictions present.

The research uses Cultural-historical Activity Theory (Engeström 1987) because this approach recognises that change, and thus learning, occurs where contradictions are confronted. Where professionals respond to, and occasionally resolve, contradictions both they *and* their systems learn. This understanding is potentially empowering as it suggests that systems are not ultimately in control, rather everything we do contributes to (re)generating the system of which we are a part.

Contradictions, gaps and dilemmas

Analyses of contradictions in EE/ESD in formal education have focused on the personal perspectives and beliefs of individual teachers (Grace & Sharp 2000; Barrett 2007; Cotton 2006) or on whether education should be *for* or *about* sustainability (Jickling 1992; Fien 1993; Jickling and Wals 2008). Contradictions can give rise to apparent gaps, variously characterised as a discourse–practice gap (Stevenson 2007; Barratt Hacking *et. al.* 2007) or a rhetoric-reality gap (Fien 1993; Edwards 2011). Such gaps are often understood to occur where there is a mismatch or contradiction between policy-level rhetoric and the availability of required resources to achieve those aspirations.

In England, where in 2010 the then Coalition Government abandoned the previous Government's National Framework for Sustainable Schools (NFSS), the direction of the policy-practice gap has the potential to be reversed. Teachers in England[*] who wish to pursue EE/ESD frameworks such as Eco Schools (FEE 2018) are likely to go *beyond* official guidance, which simply comprises a statement that schools are free to pursue ways of becoming more sustainable, "should they choose to, whilst at the same time saving money" (Department for Education, 2012, p.1). Indeed, the perceived narrowing of the curriculum with a focus on standardised tests (Spielman 2017)

[*] This is not necessarily the case in Scotland, Wales or Northern Ireland.

suggests that EE/ESD may actually run counter to the thrust of an education system that reflects a neoliberal policy environment characterised by insecurity, individualisation and financialisation (Lazzarato 2009). This environment is exemplified by features such as high stakes school inspections that lead to schools being ranked on publicly available league tables, the marketisation of education whereby schools are required to compete for pupils and more recently, the promotion by Government of performance related pay for teachers.

Within this wider context, this research sets out to identify potential contradictions within schools that continue to pursue a goal of becoming more sustainable. The principal research question has two parts:

> *(i) Are there inherent contradictions in attempting to implement education for sustainable development in schools?*
>
> *(ii) How do teachers approach such contradictions?*

The responses of teachers and headteachers and the nature or ethos of their school are not easily separable. This research therefore investigates practice in specific schools and the people working within them. Reporting on teachers' perspectives *and* school-level approaches to sustainability is beyond the scope of a single paper so the focus here is on the responses of the individuals. Different approaches that schools take vis-à-vis sustainability are discussed in a separate paper.

Contradictions and Dilemmas

For the purposes of this study a *contradiction* occurs where one promising course of action has the potential to undermine or confound the objectives of another, possibly unrelated, action. When attempting to take action in a contradictory situation, one is likely to be faced with a dilemma. For Winter (1982) all social organisations are 'constellations of conflicts of interest' (*Ibid*: 168) and he proposes a technique of dilemma analysis (employed in this research) to navigate such conflicts. Winter identifies three categories of 'dilemma' with increasing degrees of intractability ranging from *ambiguities* to *judgements* to *problems* with the latter approximating a true dilemma, i.e. a difficult choice between two or more alternatives. In reviewing competing approaches to inclusive education, Clark (1999) recognises that some dilemmas (that Winter would term *problems*) might be *re-solved* while they may never be solved. This resonates with the concept of 'wicked problems' (Bore & Wright 2009) that characterise many sustainability issues where no clear solution is apparent.

Dilemmas appear to be endemic in education regardless of current policy; Berlak & Berlak (1981) identify sixteen generic dilemmas in education grouped under the three dimensions of: curriculum, society and relating to control. This adds a further dimension, beyond levels of tractability, as these dilemmas are encountered at different *levels* within and around the school system. The idea that contradictions, and the dilemmas they present, can be found at different strategic levels informs the choice of research methodology.

The Research

Theoretical framework

In defining an ontological position, EE/ESD presents a dilemma of its own. It is at once concerned with the measurable impact of human interactions in the biophysical environment while simultaneously attempting to build capacity for negotiating a diversity of interpretations of the world. A case for a theoretical framework grounded in ontological realism but epistemological relativism is made by Gough and Stables (2012). While they adopt a "broadly Darwinian, pragmatic ontology" (*Ibid*: 369) they argue that this is not incompatible with:

> "…a semiotic epistemology … within which human survival is taken to depend upon a continuous process of meaning-making that is *constrained but not determined* by physical resource limits" (Gough & Stables 2012: 369; my italics).

This suggests a critical realist perspective (Archer *et al* 2016) that accepts that reality exists but operates independently of our perception or knowledge of it. This framework allows for inductive reasoning, an important consideration in research that is open to personal interpretations and unforeseen outcomes, while simultaneously discussing measurable environmental phenomena.

While this research is conducted with individuals, the questions it explores are inextricably linked with the prevailing culture within each school. This calls for an approach that can explore simultaneously the elements of a system, their interaction with each other and the human subjects within it. Cultural-historical Activity Theory (hereafter called 'Activity Theory') provides just such an approach while offering "a non-reductionist view of human activity" (McNicholl and Blake 2013: 295).

For Activity Theory the unit of analysis is the activity system (Figure 1). Within an activity system tensions and contradictions can arise between different elements of the system; learning occurs by working through these tensions. Where activity systems interact with each other, collective learning takes place by working through the tensions and contradictions between the systems (Nussbaumer 2012). The *subject* of an activity system (Figure 1), which might be a school or department, acts upon an *object*, e.g. learners, by means of *mediating artefacts or tools* that may include language, competitions, computers or school grounds. Activity systems rely upon a *community* of actors such as teachers, parents and support staff, who are subject to *rules*, ranging from national laws to cultural norms, while tasks are distributed among those working within the system (*division of labour*).

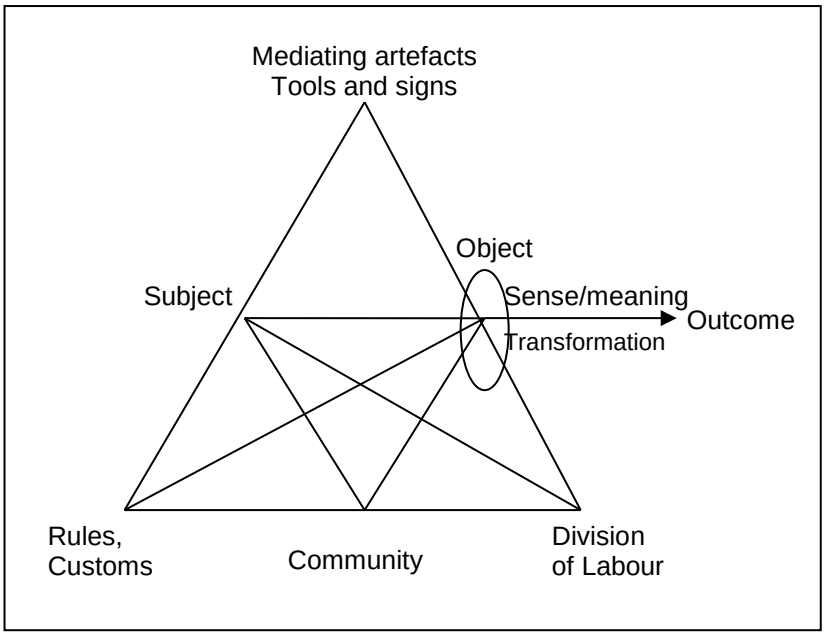

Figure 1: A Second Generation Activity System
(Adapted from Engeström in Jonassen & Land, 2000: 99)

Activity Theory and EE/ESD

Examples of Activity Theory being applied in EE/ESD research exist but are not yet widespread (Boyer and Roth (2005); Krasny & Roth (2010); Mukute & Lotz-Sisitka (2012); Silo (2013); Aguayo (2016)). There are many aspects to Activity Theory with some only known to long-standing activity theorists (Daniels 2008). This complexity may dissuade EE/ESD researchers but there are several aspects of Activity Theory that resonate with EE/ESD (Table 1).

Table 1: Potential overlaps between Activity Theory and EE/ESD

Aspect of Activity Theory	**Resonance with EE/ESD**
Inter-disciplinary (e.g. cultural and historical)	SD is inherently inter-disciplinary. The action competence 'knowledge map' is interdisciplinary (Jensen & Schnack 1997)
Systemic framework	Sterling (2001; 2003) aligns EE/ESD with systems thinking
Learning through contradictions	SD seen as learning our way forward (Foster 2008) to manage wicked problems (Tomkinson 2009)
Expansive learning	Some alignment with ESD 2 (e.g. Vare & Scott 2007) plus notions of resilience and transformation (Wals 2017)
Collective learning	Wals (2007) aligns social learning with EE/ESD
Change perspective	Being part of the process makes change happen (Orr 2004)
Underlying processes (e.g. consumption/production)	Socially-critical tradition, looks for underlying causes; does not take activity at face value (Fien 1993; Huckle 1999)

Each of these links demand further exploration than space permits here.

Applying Activity Theory

The research question: *identifying inherent contradictions in implementing EE/ESD in schools and exploring teachers' approaches to these*, demands attention to both the individual and institutional level with reference to a wider educational system. Activity Theory explores actions and relationships at three levels:

- Individual professional sense-making (e.g. a teacher)
- Collaborative meaning-making and action (e.g. a school or department)
- Systemic or collective responses and development (e.g. school or multi-school institution).

Contradictions are inevitable features of activity systems *and* the stimulus for radical change. According to Engeström (1987) contradictions occur at four levels within activity systems:

> *Primary contradictions* occur *within* an element of the activity system.
> Example: promoting healthy eating with imported (Fairtrade) fruit while encouraging a reduction in food miles within the same sustainability programme.
>
> *Secondary contradictions* occur between the different elements of the activity.
> Example: promoting transdisciplinary, active citizenship within a curriculum structured by traditional disciplines.
>
> *Tertiary contradictions* occur between the object of the dominant form of the central activity and the object of a 'culturally more advanced form' of the central activity.
> Example: a school working on recycling learns of others that focus on the circular economy.
>
> *Quaternary contradictions* occur between the central activity and its neighbouring activities.
> Example: where a school's sustainability purchasing policy runs counter to Government advice to pursue sustainability "whilst at the same time saving money."

For Engeström (1987) these contradictions make learning an ever-present possibility. Engeström's concept of expansive learning is a collective or social version of Vygotsky's zone of proximal development in which, rather than being restricted to the individual, learning can be understood as the distance between present actions and a new form of social activity that is generated as a solution to contradictions within the activity system.

The research instrument was initially conceived as a series of participatory workshops involving teachers and pupils, a format that Engeström terms a 'change laboratory'. This approach proved too cumbersome for busy organisations operating in a policy

environment characterised by narrow performance targets. After a number of false starts it was decided to switch to a less-intensive approach among several schools with the principal instrument being semi-structured, one-to-one interviews of between 40 and 90 minutes.

All interviewees claimed that the questions, based on the activity system model (Fig. 1) had indeed covered every aspect of their EE/ESD activity. Against this there was a danger of seeing the elements of the system in isolation although connections were retraceable through transcripts.

Some macro level influences were perhaps underplayed. The influence of academy trusts, which manage many schools in England, was not explored because it did not arise in the interviews. Similarly Activity Theory can underplay forces at the micro level where:

> "…social class, gender, race and even the influence of one's own psychology are not afforded a 'distinctive ontological status' … but tend to be subordinated within the configurations of an activity system"
> (McNicholl & Blake, 2013: 287).

This research did in fact delve deeper than the activity system model suggested and revealed how some individuals drew strength from colleagues or within themselves while others demonstrated degrees of frustration at their powerlessness. That said, there was always the danger that aspects such as personal relationships were not revealed as discussion focused on culture, rules or division of labour.

A particular strength of Activity Theory is the juxtaposition of subliminal features of a system such as informal rules and culture with more recognisable features such as mediating artefacts. Only after these aspects and interactions are revealed can they be challenged and changed. In this way Activity Theory identifies possibilities for transformation.

The sample
Teachers in over twenty schools were approached; each fulfilled the following criteria:

- Their school had been working on a school-wide sustainability project for at least two years

- The interviewee had been involved personally in this work

Twelve teachers and headteachers volunteered from different schools: six secondary, five primary and one middle school (Appendix 1) all based in western England. To ensure confidentiality schools and individuals were assigned pseudonyms, these reflect their gender and also the white British heritage of the interviewees.

For triangulation purposes additional interviews took place in three of the study schools with teachers who were colleagues of the interviewees but not directly involved with sustainability. Additional data sources such as school policy

documents, websites and publicly available inspection reports were reviewed to gain further detail and verify interviewees' responses.

The question schedule (Appendix 2) simply guided the conversation around the elements of an activity system in six questions with further probe questions prompting the interviewee to consider contradictions at each stage.

The use of Nvivo (qualitative data analysis software) was considered but rejected in favour of handling transcripts away from a computer screen. After repeated reading and coding, photocopies of transcripts were cut up and the coded data-units placed in marked envelopes (these correspond to NVivo 'nodes').

Two distinct approaches to qualitative research are clarified by Gough and Scott (2000) with implications for data coding. One is *emic* where unforeseen outcomes emerge from the data while an *etic* approach categorises data in relation to pre-determined frameworks. This research involved an emic process of code identification and clustering followed by an etic process in which clusters of codes were linked to one of the six elements of the activity system framework (Figure 1).

An additional form of triangulation took the form of a *dilemma analysis*, a technique developed by Winter (1982). This involved the compilation of a *perspective document*, which is a questionnaire comprising a series of dilemmatic statements derived from the interview data, to be completed by the interviewees. The procedure was as follows:

a) Analyse interview transcripts and code them for emerging themes and potential dilemmas, particularly where interviewees appear to contradict themselves
b) Collate a list of dilemmas; where these are repeated, use a composite formulation to combine data from different respondents
c) Match each statement with an opposing view drawn from the data (from the same respondent if possible)
d) Develop a questionnaire (the perspective document) in which respondents can indicate their level of agreement with each statement using a simple Likert-type scale
e) Score the responses: 1 for Strongly Agree and Agree, 0 for Undecided or -1 for Disagree or Strongly Disagree.

The resulting perspective document (Appendix 3) comprised thirty statements arranged so that numbers 1 to 15 were from one side of an opposing pair while 16 to 30 represented the other side of the contradiction. The document did not therefore offer a list of opposites to the reader although it did facilitate the matching of opposing statements when responses were analysed. With the caveat that feedback was drawn from a modest sample, the results table (Appendix 4) indicated the extent to which the contradictions identified in the interviews were confirmed as possible dilemmas among the respondents.

Eleven of the fifteen interviewees responded to the questionnaire, hence the four blank columns in the table. This meant that a total score of 22 was possible. Where pairs of opposing statements received widespread agreement among respondents (i.e.

a total score of 19-22), this suggested a possible dilemma and was ranked as Level 1. A mixed set of results ranked as a Level 3 suggesting a simple ambiguity. Where there was no agreement with either of the opposing statements, this was a Level 6 meaning that the contradiction identified in the interview data was unlikely to be an issue.

Findings

The data provided a rich picture of EE/ESD activity in the study schools. An analysis of differences between primary and secondary schools within the sample proved inconclusive so no further differentiation was attempted. Interestingly, no respondents identified contradictions themselves when asked explicitly if they had encountered any dilemmas or contradictions. Instead these only emerged from an analysis of the data and the subsequent testing using the perspective document.

A total of 69 codes emerged from the data; all but one could be related to an element of the activity system:

- Objects and Outcomes (13)
- Tools/mediating artefacts (22)
- Community (9)
- Division of labour (9)
- Rules and culture (14)
- Subject (1)
- Other (1).

'Other' refers to *impact of research on interviewees' practice*, e.g. where the interview itself provided new ideas for implementation in the school.

Fifteen possible contradictions were identified from the data. Scores from the dilemma analysis exercise made it possible to rank each contradiction from Level 1 (a true dilemma) to 6 (not an issue). Only Level 1 and 2 contradictions are discussed below. These are grouped according to their level within the activity system, from primary to tertiary. No quarternary contradictions were listed in the perspective document although one example is drawn from the interview data.

Primary Contradictions (i.e. within one element of the activity system)

A single Level 1 primary contradiction was identified within the Tools element. This presents a choice between the mediating artefacts of 'school ethos' and 'technology':

> *"Technology, like photo-voltaic arrays, wind turbines and automatic switches are important as demonstrations."* (Sarah)
>
> ***versus***
>
> *"Sustainability is not about the 'bling' of technology, it's about the school ethos."* (Ellen)

Universal agreement with the second statement contradicted the emphasis that many schools placed on 'green' infrastructure such as solar panels. This contradiction highlighted a lack of clarity about the purpose of a sustainable school, which would inevitably influence the emphasis given to the choice of mediating artefacts employed to reach that goal. Some teachers emphasised learning, e.g. 'children that question'

(Ellen) and 'developing thinking skills' (Cheryl), while others were concerned with behaviour change or 'habit forming' (Sarah). A senior teacher at Royal Secondary, was explicit in stating that while students were keen on sustainability, for his headteacher and finance team, *"it's about saving money"* (Michael).

A key mediating artefact in schools is the curriculum; this is the subject of a Level 2 primary contradiction:

> *It's important that our pupils have a balanced education across a full range of subjects without (pro-sustainability) bias.*
>
> ***versus***
>
> *We should ensure that sustainability underpins all subjects right across the curriculum, otherwise it remains optional and can be missed.*

This is not a straightforward judgement. Two interviewees expressed concern regarding bias stating that sustainability is often seen as 'political', particularly in relation to the issue of transport in primary schools where current behaviours were being challenged. This primary teacher wished to avoid being political while also wanting colleagues to address EE/ESD in their teaching:

> *I'm getting children to think about things ... because I am a teacher, I'm not there to say ... this is how it should be … it is about engagement, it is about just finding out about that fantastic world out there, and, and how it works…"*
>
> (Rebecca)

For Rebecca, there was a fine line between engagement at the level of 'finding out' about controversial issues and any suggestion of directing pupils towards particular behaviours, which she viewed as political.

A reasonably significant (Level 2) primary contradiction set habit forming against critical thinking:

> *Sustainability should be inbuilt so it's something that you do automatically, subconsciously, without thinking.*
>
> ***versus***
>
> *The aim is to develop young people that question, that want to change things; our young people should have their own opinion.*

For many respondents EE/ESD was both about developing habitual behaviours *and* encouraging pupils to question critically and think beyond orthodoxy. This ranks as a *problem* (Winter 1982) because potentially these conflicting goals could undermine each other. Such conflicts were occasionally played out *within* individuals; this eco co-ordinator claimed that promoting sustainability was at odds with her intrinsic educational values:

> *"I'm an educationalist, I'm here to educate and that will be the most powerful outcome"* (Rebecca).

Despite this, Rebecca was adamant that EE/ESD should be taken more seriously across the school. She appeared to resolve this by focusing on open-ended learning in

the context of discussing and modelling sustainable behaviours.

Secondary contradictions (i.e. between different elements of the same activity system)
The following contradictory statements provided a Level 1 contradiction because of respondents' high level of agreement with both of them:

> *There should be an identified staff member in a sustainable school … you need somebody in overall charge.*
>
> ***versus***
>
> *Sustainability should be simply …what the school does; it's everybody's responsibility.*

Respondents agreed with the need for clear leadership *and* shared responsibility across all staff. These need not be mutually exclusive of course, as one primary school eco co-ordinator found when his long standing role led to colleagues becoming:

> *"…very supportive and a lot of them did their own bits and pieces that I never really get to find out about until it's finished."* (David)

Initially this contradiction was located within the Division of Labour element of the activity system. On further analysis, however, this appeared to be a contradiction between Division of Labour and Rules and Culture. As Harris (2014) reminds us, leaders at all levels within schools could actively encourage others to take on leadership roles that contribute to change; conversely they can prevent staff from influencing or leading altogether. One respondent noted how the work of the sustainability leader in her secondary school was undermined by a school culture that she characterised thus:

> *"It's very much 'my department, my protection,' don't want to cross over those boundaries, don't want to cross-fertilise…"* (Melanie)

Here the pressures of performativity appeared to militate against any sense of shared endeavour. Melanie gave the example of asking a colleague for time to complete an assessment with a pupil:

> *"I just need 15 minutes of my free period with her just finishing this off and we're done. 'No you can't have her because I don't want her out of my lesson because she's missed time with me'..."* (Melanie)

Nobody claimed to be against the eco coordinator's efforts in Melanie's school but such concerns appeared to run counter to the school's priorities. Similarly, in this primary school, the eco-coordinator felt unsupported:

> *"I don't see any eco initiatives coming from other staff, and I don't necessarily see the support that I would want coming from other staff."*
> (Rebecca)

Rebecca noted how her school was hiring a new headteacher soon and saw this as a source of hope citing some of the actions of her current headteacher:

> *"…the matting on the school adventure playground has just been sprayed to kill the weeds that are growing through it and I'm thinking, if we're an Eco School, we need to look for more creative solutions."* (Rebecca)

Because of these contradictory actions Rebecca felt unsupported and therefore assumed that her responsibilities as the eco coordinator could not be distributed effectively:

> *"I've not investigated buying Fairtrade products in the staff room, because they'll want to go for the cheapest option, and Fairtrade isn't always cheap. At least, I'm assuming that, I've made that assumption."* (Rebecca)

In both of these cases, having an identified leader appeared to be helping others to focus on their own concerns without feeling the need to engage with sustainability. Another example of this occurred in this selective secondary school where:

> *"Predecessors have made various efforts but it has been very much a one person show…*
>
> *…there's lots of staff who are interested – how much they're prepared to get involved is another thing."* (Barbara)

Barbara's role in leading sustainability appeared to have absolved colleagues of taking responsibility themselves despite having their apparent interest in the area.

Responses to the perspective document produced one other Level 1 secondary contradiction, this time between Tools and the desired Outcome of the activity:

> *Sustainability means facilitating pupil-led action, giving them opportunities to participate as monitors, committee members, etc.*
>
> ***versus***
>
> *Spontaneous pupil-led action without any teacher involvement is a key indicator of success in a sustainable school.*

The judgment made here may not be *between* these two approaches but about *when* external facilitation (Tool) should recede to allow for spontaneous action (Outcome). A popular form of facilitation was through green teams, eco clubs and/or school councils. By definition 'clubs' do not involve all pupils so they could potentially create barriers for some pupils as this secondary teacher reported:

> *"…there's a feeling within the school community that … the eco group that I run is a bit geeky and it's … just the science nerds… So there's a bit of a perception barrier…"* (Bob).

Words like 'geeky' and 'nerds' illustrate the otherness of eco group members as perceived by their peers. Maintaining momentum was a recurring concern in another secondary school:

> *"It's quite difficult to get students interested – they don't see the point. The majority do it because there is some incentive rather than believing in the cause"* (Sarah).

Here the term 'cause' revealed the status of sustainability as a special interest rather than an accepted approach. In addition, the need for 'some incentive' appeared to contradict the proposed success indicator of spontaneous pupil-led action. That said, if Sarah simply sought the engagement of pupils in order to give them a taste of how it felt to take action, then an incentive may have been an appropriate tool.

The following contradiction between incentives and sanctions arose in the data but was universally rejected (Level 6) by respondents:

> *It's a good idea to have positive reinforcements such as 'green awards' built into our merit system*
>
> ***versus***
>
> *An effective approach is to run a 'name and shame' campaign to improve behaviour and for pupils to tell the teachers off!*

Although all respondents rejected the second statement, the interview data included teachers expressing enthusiasm for shaming colleagues often with the help of pupil 'eco-spies'. It is likely that the perspective document itself prompted a deeper reflection on specific aspects of teachers' practice.

Tertiary contradictions (i.e. between the object of the activity system and that of a 'culturally more advanced form' of the activity)
There were only two tertiary contradictions in the perspective document, neither of which registered as strong dilemmas:

> *Government support is needed to drive schools to act sustainably*
>
> ***versus***
>
> *We shouldn't wait to be told what to do by Government*
>
> *We can work around Government edicts or simply wait them out*
>
> ***versus***
>
> *Our goal has to be student achievement as measured by* Ofsted (Government inspectorate)

Neither pair of statements is mutually exclusive. In Winter's (1982) terms these are *ambiguities* because Government policy is generally considered to be beyond the influence of any single school. That said, responses to this situation can vary from outright compliance to public resistance (schools openly supporting the 2019 climate strikes provide an example of the latter). The final statement on student achievement was universally rejected by respondents who clearly recognised a broader purpose to the education they provide. Ofsted's priorities cannot be ignored however, as this headteacher explained:

> *"…if my reading, writing and maths results dip I know there's going to be a knock at the door and I'm, you know, nights at Tesco's[†] here I come."*
>
> (Heather)

In a policy climate where schools are ranked using test results, the possibility of a headteacher suddenly losing their job is not unrealistic. While Heather's tone is light hearted, the prevailing culture of performativity (Ball & Olmeda 2013) leaves her with an underlying fear, itself a dimension of neoliberalism (Lazzarato 2009).

Another tertiary contradiction that did not translate readily into the perspective document due to its specificity was this craft-based project involving local pensioners, including pupil's grandparents. Different generations worked together on a tapestry that was displayed in the cathedral some miles away:

> *"… that's the school community together, it really is – and that's Eco. But that doesn't feature in Ofsted or anything, it doesn't translate into results particularly, but it does make for a happy workforce ... but you can't immediately translate it into Level 2A, or something mathematical…"*
>
> (Rebecca)

This inter-generational activity was criticised by inspectors for its "lack of emphasis on child-initiated learning" (Ofsted Inspection Report, 2012). It appeared that there was a narrow range of evidence being sought by inspectors who did not, either through habit or instruction, allow themselves to consider the wider benefits of this educational activity. There was, for example, no recognition of "what can be achieved when children collaborate with each other and with adults to develop and make use of new knowledge…" (Barratt Hacking *et al*, 2007: 236).

All respondents concurred that inspectors' judgements on school performance bore no relation to the quality of work on sustainability as this headteacher explained:

> *"…although an Ofsted inspection will say 'this school has a rich curriculum' … what they really benchmark us on is, 'can our children read, write and count?' and anything else might be a nice little bonus…"* (Philip).

A review of this school's Ofsted reports confirmed this concern. Positive references were made about the school's achievement data but there was no mention of Philip's 'little bonus' such as being awarded an Eco School Green Flag.

Quaternary contradictions (i.e. between the central activity and its neighbouring activities.)

This level of contradiction can become apparent when the values of wider society conflict with those that the school is trying to promote. None of these were covered in the perspective document but Melanie recounted an experience that suggested a contradiction between her attempts to model positive behaviour (buying Fairtrade bananas) and attitudes prevalent in the community around her school as exemplified

[†] Tesco is a leading supermarket. Working on night shifts in Tesco is popularly seen as a job that is readily available to anyone who finds themselves unemployed.

by a teaching assistant. Here Melanie was complaining about the assistant's comments made during the lesson:

> *"…if someone's going, 'Oh, you can get those sort of bananas lots cheaper than that in Asda* (supermarket) *and they're not Fairtrade that's so much the better.' Those little things … can undermine…"* (Melanie).

In this example the teaching assistant represented a locally shared concern for food prices that was overriding issues such as Fairtrade or food miles. While Melanie did not tackle her colleague, she did persist in doing the 'right thing', as she perceived it, in the face of this undermining behaviour.

Other examples of societal influence included the case of a mother who repeatedly contravened the school's healthy eating policy by bringing her child burger and chips for lunch each day. Again wider social attitudes were contradicting a school's efforts to become more sustainable by improving pupils' diets. In this case the headteacher (Philip) tackled the contradiction head on by having 'a feisty conversation' with the parent.

Elsewhere a secondary Design and Technology teacher (Amy) complained that young people were "very, very, very selfish" because they only wanted to make things for themselves rather than for others. She saw this as a social trend but was pleasantly surprised at how positively her 13-14 year old pupils responded to being asked to prepare packages of materials to be sent to Sudan. In this case an apparent quarternary contradiction between prevailing attitudes and the school's ethos, was based on the teacher's misplaced assumption about her students.

Responses to contradictions

Interview data based on the activity system model coupled with a dilemma analysis identified multiple contradictions yet the extent to which respondents did *not* recognise them as such, even when asked directly if they could think of specific examples, was striking. This response was typical:

> *"I think there are some contradictions, possibly what we've already covered."* (Rebecca)

When pressed further to identify contradictions or dilemmas, coordinators of EE/ESD pointed to competing priorities in the system:

> *"I guess the main thing really is that by not being prevalent across everything it's saying it's not important."* (Bob)

Bob's concern that EE/ESD was outcompeted by other priorities in his secondary school was echoed in this exchange with a middle school teacher:

> Interviewer: *I'm just wondering if there's any sort of contradiction in that system where one thing is affecting another?*
>
> Julie: *Oh hundreds I should think ...*

Interviewer: *Oh?*

Julie: *It's not a straight forward line is it? It's more, I'd say, this line here and these are all arrows coming into here, trying to get you off course, trying to [laughs] ... It's just not seen as important.*

Barriers were often seen as irritations or frustrations but not as contradictions. Ultimately, the question was put back to the researcher to find the contradictions in what the interviewee has already said. A desire to explore this phenomenon led to a further (emic) analysis of the data. Reflections on this exercise combined with the analysis above provide the focus for the following discussion.

Discussion: Managing contradictions – or not

The issue of respondents not recognising situations as contradictions or dilemmas is significant because for professionals to overcome contradictions, they first need to identify them. Furthermore, Activity Theory recognises that *systems learn*; they do this by recognising and overcoming contradictions. A system that does not recognise its own inherent contradictions cannot develop effectively.

Teachers who make explicit their own encounters with contradictions can offer their learners examples of meaningful, contextualised learning opportunities that are so difficult for schools to provide (Sauvé 2017). In this way, contradictions within the school activity system and the dilemmas they present, *whether they are overcome or not*, have the potential to become valuable elements within EE/ESD rather than simply barriers for committed teachers. By absorbing or responding to contradictions, teachers model what it is to be a resilient learner with a high degree of 'adaptive capacity' (Smith & Green 2011; Sterling 2010). Making this achievement explicit may serve to build the self-esteem of teachers who, in this study, are promoting EE/ESD in an unsupportive policy environment.

From the interview data, five types of response to contradictions can be identified. It is important to note that while the five responses below are discussed in sequence, the same person might reflect more than one of them at any given time depending on the specific situation being encountered.

Unawareness

Despite their evident interest in sustainability, interviewees lacked access to critical literature or relevant policy developments. This was not so much a response as the absence of one, for example:

Interviewer: *The Sustainable Schools Strategy of the last Government, is that something you were aware off?*

Cheryl: *No, not really. No [laughing]. We work very closely with* [the local authority] *and … everything we do feeds from them really…"*

Within months of this interview, Cheryl's local authority officers had been made redundant so even this information source became unavailable. There is no prospect

of overcoming a discourse-practice gap (Stevenson 2007) if practitioners are not exposed to the discourse. In addressing this gap, the role of professional development in EE/ESD is critical; however, interviewees reported that this had become unavailable, which exacerbated this situation.

Powerlessness

Half of the teachers in this study expressed frustration because their aspirations for EE/ESD in their school exceeded those of their school leadership. Examples included Rebecca who felt that her school's Green Flag award was undeserved because her headteacher simply treated it as a marketing tool:

> *"I think I've got to the point where I'm thinking, we have to progress. And, until we do, I'm not willing, I want us to NOT have that Green Flag flying there..."* (Rebecca)

The achievement of a Green Flag could be interpreted as a significant contribution to Rebecca's objective within the activity system. The headteacher, on the other hand, was focused on the need to 'sell' the school in a marketplace that successive neoliberal policies had helped to create. Rebecca's response to this contradiction appeared to stem from an inability to confront the headteacher, hence a lack of power defines this response. Similarly, Julie, the middle school eco co-ordinator, had no doubt about the nature of blocks to progress:

> Interviewer: …*if you could change things … here…*
>
> Julie: *Well only management really.*
>
> Interviewer: *OK, so it's back to that.*
>
> Julie: *That's where it starts and stops I'm afraid.*

In this school a recent Ofsted Report had indicated that it was well managed, something that may have contributed to Julie's difficulty in tackling the specific issue of leadership in relation to EE/ESD. Such a favourable judgement on the school leadership apparently left little opportunity to open a conversation about the lack of progress on sustainability. For the school's senior management team this was not a contradiction because external school inspections had paid no heed to EE/ESD. For Julie however, there was a mismatch between the school's published statements in support of sustainability and the lack of direction or resources available to it.

The potential for undermining staff morale is clear and both Julie and Rebecca exhibited signs of frustration and burn out in their interviews such as sighs, headshaking and exasperated tones. Schools have their own rhetoric-reality gaps and making these contradictions explicit would be an essential first step in confronting them.

There is a sharp contrast between this response and that of the two headteachers interviewed. Philip, as seen above, tackled directly the parent who gave their child burger and chips for lunch as this contradicted the school's desired behaviour change

in relation to healthy eating. Similarly, Heather, who mentioned Ofsted's focus on reading and writing, saw this not as a contradiction but as a planning challenge:

> *"… next year I want to go to embedding a kind of eco sustainability agenda in at least one of the themes because then all the writing and the numeracy and everything should spin off from that.* (Heather)

In this way Heather ensured that sustainability-related learning was prioritised. In these two cases the headteacher's power to make decisions was crucial. That said, in situations where headteachers are subordinate to chief executives of clusters of schools (known in England as multi-academy trusts), the outcome might be quite different, possibly leading to any one of the range of responses discussed here.

Accommodation 1: Denial

This is a familiar term in psychology where denial is often understood as an individual's coping mechanism (Bonannao 2009). Where interviewees did not feel in a position to address contradictions, they sometimes avoided a sense of cognitive dissonance (Festinger, 1957) induced by rhetoric-reality gaps by simply focusing their attention elsewhere.

In common with the above experience of Rebecca and Julie, another eco coordinator, Sarah, had little support from the leadership of her secondary school:

> *"They don't drive sustainability. The staff green group really drives that change – but there's no finance and no time given for it."* (Sarah)

This observation was made only once. Rather than dwell on the lack of management support, Sarah claimed that progress was hampered above all by the school buildings. She recalled the school where she worked previously:

> *"The difference there was that it was easier because we had a new building – it had solar panels, rainwater harvesting, etc.. We used that as a teaching resource. … A more old-fashioned style school teaches a lot less about how we could use the building. We've had sensor lights fitted but they're not by row so it's all or nothing…"* (Sarah)

On the one hand Sarah talked about the need to instil habits in students, such as turning off lights, yet the light sensors she wanted to install would remove the need for any such habit. Light sensors are not the issue here. Sarah's earlier comment about the green group reveals a rather piecemeal approach to EE/ESD across the school. Rather than discuss this she preferred to focus on the shortcomings of technical infrastructure.

Denial also arose in the example of the quarternary contradiction discussed above where the teacher, Melanie, was undermined by a teaching assistant who openly stated a preference for non-Fairtrade bananas. Melanie chose to ignore the assistant's comments in an attempt to minimise disruption rather than confront the issue. In doing so, however, she missed a potentially powerful learning opportunity for her students who might have observed, and possibly engaged in, an open discussion around the tension between Melanie's consumer choices and those of the assistant.

Accommodation 2: Satisficing
Interviewees mostly *manage* contradictions rather than complain; they have learned to dance among competing possibilities. This is particularly true of the primary contradictions above. Interviewees appear to be 'satisficing' (Cuban 1992), that is, finding good enough compromises based on professional judgements about what should be sacrificed in order to preserve that which is important to them.

This secondary school eco coordinator recognised that sustainability did not have widespread support across the school, he therefore decided to:

> *"…cherry pick lots of little different things from different areas that are going on already that are actually good examples of sustainability."* (Bob)

In this way Bob was able to construct a narrative of progress to encourage further action despite the fact that many of his colleagues simply had other priorities.

Elsewhere a recently qualified secondary school teacher, Louise, found herself designated as eco coordinator as well as Special Educational Needs Coordinator. She managed to overcome potential contradictions in her roles, not least the time to meet her various responsibilities, by building connections between sustainability and inclusion during a school-wide review of student behaviour:

> *"There's been a behaviour review, where I've been leading a secret flag of inclusion … and a secret flag of sustainability so that when people are talking about things I introduce the dialogue of inclusion, the dialogue of sustainability."* (Louise)

Louise took the opportunity of this review exercise to discuss her strategies for reducing pupil exclusions. She explained that excluded pupils required additional staff input for catch-up lessons, leading to staff burn out, an approach that was culturally, socially and financially unsustainable. In this way Louise introduced EE/ESD themes into the mainstream discussions of the school without appearing to force these ideas onto busy colleagues.

The approach taken by Rebecca (discussed above), providing open-ended learning in the context of sustainability while apparently avoiding political issues, is another example of this response.

The term accommodation is often portrayed as an inadequate response (Huckle 1999; Bowers, 2002). However, *satisficing,* accommodating change through daily judgements and adjustments *is* learning one's way forward, something Foster (2008) sees as the very essence of sustainability. In the cases above, teachers are being intelligent survivors, responding to competing priorities but not losing sight of their own beliefs or theories-in-use, *resolving* rather than *solving* dilemmas (Clark 1999). While this may not be the radical transformation called for by some (Sterling 2014; Wals 2017), it is an effective, pragmatic response.

Expansive learning

This involves expanding the system to overcome the contradiction (Engeström 1987). Most interviewees describe incremental innovation but the data does include examples of this type of response.

A primary school eco co-ordinator, Ellen, faced a contradiction between the school's ambition to be 'a sustainable school' and non-negotiable maintenance contracts that tied the school to inefficient practices in relation to its energy use. Rather than dwell on such practical barriers, Ellen expanded the school's definition of what it meant to teach sustainability:

> Ellen: *We don't have solar panels or a wind turbine – the bling – but you don't need that because it's an approach.*
>
> Interviewer: *So, what are you aiming to achieve by working on sustainability?*
>
> Ellen: *Children that question. Children that want to change things.*

Ellen's focus on children's learning as a core concern of EE/ESD enabled her to convince colleagues to see sustainability as a whole institution approach:

> *"Starting with yourself and growing outward. It's become part of how we behave – it's an approach and an attitude…"* (Ellen)

This represents a considerable shift away from preoccupations with technology such as those of Sarah described above.

A further example is provided by a newly-appointed primary headteacher, Heather, who wished to increase opportunities for outdoor learning thereby reversing a contradictory situation where time spent outside was seen negatively, e.g. litter-picking as a punishment. She did this by zoning the school grounds so that children had access to zones of woodland or grass but:

> *"…if anybody doesn't stick to those rules they're moved into the next zone down until they're on zone one, which is the tarmac area, which bores them to tears and they hate it so they kind of earn the right to come out again."*
>
> (Heather)

Heather's zoning policy shifted the thinking of staff and pupils while maximising the enjoyment of the school's green space.

Rather than accommodating contradictions within existing practice, these expansive approaches illustrate an *invisible breakthrough* (Engeström 1987). This is analogous to Gregory Bateson's (1972) concept of 'Learning 3' (where Learning 1 is basic conditioning and Learning 2 is playing with the rules or experimenting beyond them) or 'third order learning' (Sterling 2001). In each case the problem is expanded in order to overcome contradictions. The examples are necessarily isolated, Engeström (2002) says of triple loop learning, "we cannot do Learning 3 all the time, we would go mad!"

Expansive learning requires a degree of risk-taking because it challenges conventional thinking. This requires self-belief, a degree of courage and, crucially, supportive relationships. The two examples above were achieved by people who claimed to have drawn strength from their professional relationships. Ellen drew on the support of a network of teachers organised by her local authority. Heather had a supportive governing body with one school governor in particular encouraging her to go further in her plans for EE/ESD and outdoor learning. Conversely powerlessness and denial appear to occur in cases where professionals feel most isolated or unsupported within their own activity system.

Learning our way forward

The examples of expansive learning discussed above demonstrate system-wide shifts in discourse, and ultimately practice, initiated by creative thinking. This echoes the process of *structuration* (Giddens 1991), i.e. by engaging fully in an activity we change the rules in subtle ways. It is a systems attribute that Maturana and Varela (1987) term 'autopoietic' or self-creating. While the powerlessness to satisficing responses appear to be less obvious examples of autopoiesis, in each case subtle changes were taking place. Even teachers demonstrating the non-response of unawareness were impacting their activity system, albeit unwittingly. This realisation can offer hope as well as practical strategies for frustrated professionals such as those encountered in this research.

Reflections on methodology

This research used Activity Theory (Engeström 1987) in order locate a hierarchy of contradictions at different strategic levels within the schools. This did not, however, describe the severity or intractability of the contradictions. Drawing on Winter's (1982) characterisation of contradictions as *judgements*, *ambiguities* or *problems* the study also used dilemma analysis to suggest the degree of intractability in each case.

What emerged was a three-stage process that, on reflection, could be outlined as *identify – assess – locate*:

(a) *Identify* – Based on discussions with system stakeholders (teachers, assistant staff, students) consider challenges that might be framed as contradictions; present these in the form of opposing statements to be distributed as a perspective document to stakeholders, i.e. dilemma analysis.

(b) *Assess* – Guided by the responses to the perspective document, decide on the seriousness of each contradiction using Winter's categories: *judgements* (where decisions can be made), *ambiguities* (requiring careful discussion and monitoring) or *problems* (true dilemmas).

(c) Locate – Based on the activity system model, assign the strategic level of the contradiction within the system using Engeström's hierarchy from *primary* to *quarternary.*

The outcome of such an analysis would support a deliberative, response to contradictions so that the activity system could effectively learn its way forward while being cognisant of the possible responses among stakeholders identified above. *Unawareness* may no longer apply as a result of this process while *powerlessness* and

denial might also be avoided. A proactive decision could then be made as to whether each contradiction required *satisficing* through careful management or presented an opportunity for *expansive learning*. In this way sustainability would shift from being an indistinct goal to becoming "a capacity for critical thinking, reflexivity, and transformation" (Wals 2017:19) within the school.

A key to success is the level of engagement of the various stakeholders in the system. Indeed this particular study would have been strengthened greatly by involving stakeholders in each activity system more fully. Activity Theory was not intended to be reduced to a set of questions for use in semi-structured interviews. That said, the model did provide an effective framework for exploring a school's activity system with busy professionals. Had it been possible to employ a participatory 'change laboratory' approach such as that used by Edwards *et al* (2009), then principal stakeholders would have been involved throughout the generation and analysis of the data thereby increasing opportunities for system learning while enhancing the trustworthiness of the findings.

Conclusion

By recognising sustainable development as a learning process we can view its inherent contradictions as prerequisites of – rather than barriers to – learning (Jickling & Wals 2008). The analysis of contradictions within any system then becomes a quest to identify potential learning opportunities. In the case of schools, the impact of this learning can be magnified by presenting learners with authentic examples of contextualised learning in the face of contradictions.

This paper proposes a process for identifying and assessing contradictions in schools while highlighting a range of ways in which teachers might respond to these. This opens the way for further study that could both highlight contradictions in institutions *and* reveal the strategies that professionals adopt in resolving them. This in turn could offer more general strategies for approaching 'wicked problems' in education (Bore & Wright 2009).

EE/ESD is still a minor feature on the educational landscape yet its discourse encompasses some of the most significant challenges of our times. For educators who take this area of education seriously, the very act of confronting the contradictions that they encounter can provide a model for the skills and dispositions required in creating a more sustainable society.

References

Aguayo C (2016) Activity Theory and Online Community Education for Sustainability in Gedera D S P & Williams P J *Activity Theory in Education*. Rotterdam: Sense

Ball S J & Olmedo A (2013) Care of the self, resistance and subjectivity under neoliberal governmentalities in *Critical Studies in Education*, 54:1, 85-96

Bateson G (1972) *Steps to an Ecology of Mind*. Chicago: University of Chicago Press

Barratt Hacking E, Scott W & Barratt R (2007) Children's research into their local environment: Stevenson's gap, and possibilities for the curriculum, *Environmental Education Research*, 13:2, 225-244

Barrett M J (2007) *Homework and fieldwork: investigations into the rhetoric–reality gap in environmental education research and pedagogy* in *Environmental Education Research*, 13:2, 209-223

Berlak A & Berlak H (1981) *Dilemmas of Schooling: Teaching and Social Change*. London: Methuen

Bonanno, George A (2009). *The Other Side of Sadness: What the New Science of Bereavement Tells Us about Life After Loss*. New York: Basic Books

Bore A & Wright N (2009) The wicked and complex in education: developing a transdisciplinary perspective for policy formulation, implementation and professional practice, *Journal of Education for Teaching: International research and pedagogy*, 35:3, 241-256

Bowers C A (2002) Toward an Eco-justice Pedagogy, *Environmental Education Research*, 8:1, 21-34

Boyer L & Roth W-M (2005) Individual | collective dialectic of free-choice learning in a community-based mapping project, *Environmental Education Research*, 11:3, 335-351

Clark C (1999) Inclusive education and schools as organizations, *International Journal of Inclusive Education*, 3:1, 37-51

Cotton D R E (2006): Implementing curriculum guidance on environmental education: the importance of teachers' beliefs, *Journal of Curriculum Studies*, 38:1, 67-83

Cuban L (1992) Managing Dilemmas while Building Professional Communities, in *Educational Researcher*, 21:1, 4-11

Daniels H (2008) *Vygotsky and Research*. Abingdon: Routledge

DCSF (2008) *Planning a sustainable school: Driving school improvement through sustainable development*. London: Department for Children, Schools and Families

Department for Education (2012) Top Tips for Sustainability in Schools
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/187037/DFE-32056-2012.pdf

Edwards A, Daniels H, Gallagher T, Ledbetter J and Warmington P (2009) *Improving Inter-professional Collaborations: Multi-agency working for children's wellbeing*. London: Routledge

Edwards J (2011) *Towards effective socially-critical environmental education: stories from primary classrooms*, PhD Thesis, Melbourne: RMIT University

Engeström Y (1987) *Learning by Expanding: An Activity - Theoretical Approach to Developmental Research*. Helsinki: The Laboratory of Comparative Human Cognition
Accessed 2011-13 at: http://lchc.ucsd.edu/mca/Paper/Engestrom/expanding

Engeström Y (2002) A video interview with Yrjo Engeström, Lancaster: LUTV.
Accessed November 2005 and May 2013 at:
http://csalt.lancs.ac.uk/alt/engestrom/engestrom.mpg

FEE (2018) Foundation for Environmental Education – EcoSchools Programme.
Accessed July 2018 at: http://www.fee.global/eco-schools-1

Festinger L (1957) *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press.

Fien J (1993) *Education for the Environment: Critical Curriculum Theorising and Environmental Education*, Geelong: Deakin University

Foster J (2008) *The Sustainability Mirage*, London: Earthscan

Giddens A (1991) *Structuration theory: past, present and future* in C. G. A. Bryant & D. Jary (Eds.) *Giddens' theory of structuration: a critical appreciation* (201-221). London: Routledge

Grace M & Sharp J (2000) Exploring the Actual and Potential Rhetoric-reality Gaps in Environmental Education and their Implications for Pre-service Teacher Training. *Environmental Education Research*, Vol. 6, No. 4

Gough S & Scott W (2000) Exploring the Purposes of Qualitative Data Coding in Educational Enquiry: Insights from recent research, *Educational Studies*, 26:3, 339-354

Gough S R & Stables A (2012) Interpretation as Adaptation: Education for Survival in Uncertain Times, *Curriculum Inquiry*, 42:3, 368-385

Harris A (2014) *Distributed Leadership Matters: Perspectives, Practicalities, and Potential*. Thousand Oaks, California

Huckle J (1999) Locating Environmental Education Between Modern Capitalism and Postmodern Socialism: A Reply to Lucie Sauvé, *Canadian Journal of Environmental Education*, 4, 36-45

Jensen B B & Schnack K (1997) The Action Competence Approach in Environmental Education, *Environmental Education Research*, 3:2, 163-178

Jickling, B (1992) Why I don't want my children to be educated for sustainable development, *Journal of Environmental Education*, 23:4, 5-8

Jickling B and Wals A E J (2008) Globalization and environmental education: looking beyond sustainable development, *Journal of Curriculum Studies*, 40:1, 1-21

Jonassen D H & Land S M (eds.) (2000) *Theoretical Foundation of Learning Environments*, Mahwah, New Jersey: Lawrence Erlbaum Associates
Krasny M E & Roth W-M (2010): Environmental education for social–ecological system resilience: a perspective from activity theory, *Environmental Education Research*, 16:5-6, 545-558

Lazzarato M (2009) Neoliberalism in Action Inequality, Insecurity and the Reconstitution of the Social, *Theory, Culture & Society*, 26:6, 109–133

Maturana H R & Varela F J (1987) *The Tree of Knowledge: The Biological Roots of Human Understanding*. London: Shambhala

McNicholl J & Blake A (2013) Transforming teacher education, an activity theory analysis, *Journal of Education for Teaching: International research and pedagogy*, 39:3, 281-300

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, DOI: 10.1080/10749039.2012.656173

Nussbaumer D (2012) An overview of cultural historical activity theory (CHAT) use in classroom research 2000 to 2009, *Educational Review*, 64:1, 37-55

Patton M Q (1990) *How to use Qualitative Methods in Evaluation*. London: Sage Publications

Orr D W (2004) *The Last Refuge: Patriotism, Politics and the Environment in an Age of Terror*. Washington DC: Island Press

Skaalvik E M & Skaalvik S (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *Journal of Educational Psychology, 99*(3), 611-625.

Smith B & Green R (2011) *Resilient Communities, Resilient Environments*, Gland: IUCN. Accessed May 2012 at https://www.iucn.org/news_homepage/news_by_date/?7255/Resilient-Communities-Resilient-Environments

Spielman A (2017) HMCI's commentary: recent primary and secondary curriculum research. Accessed May 2018 at: https://www.gov.uk/government/speeches/hmcis-commentary-october-2017

Sterling S (2001) *Sustainable Education, Re-visioning Learning and Change*, Dartington: Green Books

Sterling S (2003) *Whole Systems Thinking as a Basis for Paradigm Change in the Context of Sustainability*, PhD Thesis, Bath: University of Bath

Sterling S (2010) Learning for resilience, or the resilient learner? Towards a necessary reconciliation in a paradigm of sustainable education, *Environmental Education Research*, 16:5-6, 511-528

Sterling S (2014) Separate Tracks or Real Synergy? Achieving a Closer Relationship between Education and SD, Post-2015, *Journal for Education for Sustainable Development*, Vol.8 (2) 89-114

Stevenson R B (2007): Schooling and environmental education: contradictions in purpose and practice, *Environmental Education Research*, 13:2, 139-153

Sauvé L (2017) "Education as Life" in Jickling B & Sterling S (Eds) *Post-Sustainability and Environmental Education*. Cham: Palgrave/Springer

Tomkinson B (2009) *Coping With Complexity: The ability to manage complex problems* in Stibbe A (ed.) (2009) *The Handbook of Sustainability Literacy*, Dartington: Green Books.

UNECE (2005) *The UNECE Strategy for Education for Sustainable Development*. Geneva: UNECE

UNESCO (2017) *Education for Sustainable Development Goals Learning Objectives.* Paris: UNESCO

UNESCO (2014) *Aichi-Nagoya Declaration on Education for Sustainable Development.* Paris: UNESCO. Accessed April 2017 at: https://sustainabledevelopment.un.org/content/documents/5859Aichi-Nagoya_Declaration_EN.pdf

UNESCO-UNEP (1978) *Inter-governmental Conference on Environmental Education*, 14-26 October 1977, Tbilisi. Paris: UNESCO-UNEP

van Eijck M & Roth W-M (2007) *Improving Science Education for Sustainable Development*, PLoS Biol 5:12 Accessed December 2013 at: http://www.plosbiology.org/article/info:doi/10.1371/journal.pbio.0050306

Vare P & Scott WAH (2007) *Learning for a Change: exploring the relationship between education and sustainable development*; Journal of Education for Sustainable Development 1:2, 191–198

Wals A E J (2007) *Social Learning towards a sustainable world*, Wageningen: WAP

Wals A E J (2017) "Transformative Social Learning for Socio-Ecological Sustainability at the Interface of Science and Society: A Forward-looking Retrospective" in Michelsen G & Wells P J (Eds.) *A Decade of Progress on Education for Sustainable Development Reflections from the UNESCO Chairs Programme*. Paris: UNESCO

Winter R (1982) 'Dilemma analysis': a contribution to methodology for action research, *Cambridge Journal of Education*, 12:3, 161–74

Appendix 1: Details of the interviewees and sample schools

Interviewee (Pseudonym)	Gen-der	Role in school	No. years' teacher exper-ience	School (Pseudonym)	Phase	Setting (*Eco-Schools Flag*)	No. of pupils	Ofsted Score (Previous)
Sarah	F	Science	<10	**Valley**	11-18	Suburban – Academy	1,400	3(1)
Amy	F	Design & Tech	>15					
Barbara	F	PSHE/Citizenship	>15	**Broadreach**	11-18	Suburban – Grammar – Language/Science Coll.	790	1 (1)
Michael	M	Science/Senior manager	>25	**Royal**	11-16	Rural – Arts Coll. – Academy	450	3 (3)
Bob	M	Geography	4	**Farm**	11-18	Suburban – Academy (*Green Flag*)	1,280	1 (1)
Louise	F	Science	2	**Newhouse**	11-16	Outer city housing estate – Arts Coll. (*Silver Flag*)	730	4 (3)
Melanie	F	Design & Tech	2					
Cheryl	F	English	6	**Kings**	11-18	Suburban – Science Coll. (*Green Flag*)	1,250	2
Philip	M	Head	>25	**Manor**	4-11	Urban (*Green Flag*)	580	2 (3)
Heather	F	Head	>10	**Thatchwell**	4-10	Rural (*Green Flag*)	180	2 (2)
David	M	KS2 Assist. Head	20	**Park**	4-11	Suburban (*Green Flag*)	400	2 (3)
Ken	M	Maths lead	>10					
Julie	F	Sustainability lead	>10	**Abbey**	9-12	Rural (*Green Flag*)	280	2
Ellen	F	Sustainability lead	<10	**New**	3-9	Urban (*Green Flag*)	370	2
Rebecca	F	Geography	>10	**Strawhill**	4-9	Rural (*Green Flag*)	45	2

Appendix 2: Question schedule

Exploring the roadblocks and opportunities for sustainable schools **(draft title)**

Thank you very much for agreeing to do this interview. To begin with please read and sign the Consent Form.

I'm using an approach called activity theory that looks at the activity within a school as if it is a system. This system has the following elements:

Subject – Object – Tools – Division of labour – Rules/culture – Community (Diagram)

1. Defining the **Object**:

    a. Do you have your own definition of sustainability or sustainable development? NB This term is used broadly. In schools this area of activity is described using various terms including *environmental education* and *education for sustainable development* (EE/ESD)

    b. What are your aims in relation to sustainability in your school?

    c. Does the school have any declared aims on sustainability?

    d. What do you feel would be the outcomes for your students?

    e. In the past the Government had an aim of making every school a sustainable school by 2020. Are you aware of this or any other initiatives?

2. Firstly, the **tools** at your disposal, I'd include in this:

    a. The curriculum and any syllabus within that

    b. Professional development for you and/or colleagues

    c. Your teaching methods and style, including equipment such as whiteboards, blackboards, ICT, outdoor activities. Project work, etc. (pedagogy)

    d. Student assessment and formative M&E

    e. Student participation

    f. Any other tools that I've not mentioned?
        - Do you see any need for change?
        - Do you see any opportunity for change?
        - What's holding this back?

3. Now, about the **division of labour** within the school:

    a. Who is involved in determining the vision of the school?

b. In particular, who helps to make it more or less sustainable? (Through policy or practice)
    - Do you see any need for change?
    - Do you see any opportunity for change?
    - What's holding this back?

4. Now to **rules, regulations and culture** (unspoken rules or ways of doing things)

    a. Are there any regulations or legal requirements that help or hinder the school in becoming more sustainable?
        - Do you see any need for change?
        - Do you see any opportunity for change?
        - What's holding this back?

    b. How about school rules?
        - Do you see any need for change?
        - Do you see any opportunity for change?
        - What's holding this back?

    c. And what of the school ethos or culture?

    d. Is culture something that is declared clearly – is the reality the same as the declaration or is that more of an aspiration?
        - Do you see any need for change?
        - Do you see any opportunity for change?
        - What's holding this back?

5. Lastly, I'd like to think about **community**, that can be within the school, (teaching staff, assistants, administrators, senior managers, governors, etc.) and the wider community beyond the school, (parents, charities, businesses, neighbours, etc.)

    a. Do you see their involvement as part of or contributing to sustainability?

    b. Do they detract in any way?
        - Do you see any need for change?
        - Do you see any opportunity for change?
        - What's holding this back?

6. Have I left anything out?

7. If we haven't mentioned any already… are there contradictions between the way that these different elements operate? I'm going to look for this when I analyse this data but maybe you can already see something?

Thank you!

Appendix 3: Perspective document

Are There Inherent Contradictions in Attempting to Implement Education for Sustainable Development in Schools?

No.

Perspective Document

This *Perspective Document* comprises a number of statements taken from the interviews I conducted with you and a number of other teachers so some of your own words are almost certainly included here. Before concluding my research, I would be grateful for some feedback on these statements. This exercise should take no more than five minutes.

Please indicate your level of agreement by entering a number between 1 and 5 in the box next to the statement where:

1 = Agree Strongly *2 = Agree* *3 = Undecided*

4 = Disagree *5 = Disagree strongly*

Please complete the form and return it to me at (xxx@xxx) at your earliest convenience but no later than XXXX.

Many thanks
XXXXX

	Statements	**Enter: 1,2,3,4 or 5**
1	Government support is needed to drive schools to act sustainably; if sustainability was at the core of what the Department for Education wanted, it would be at the core of schools	
2	It's important that our pupils have a balanced education across a full range of subjects without bias	
3	Driving sustainability in school requires voluntary effort – it's important to spend our own time on this to make it work	
4	There are too many rules (health and safety, data protection, etc.) and associated paperwork to do things differently these days	
5	There should be an identified staff member in a sustainable school, a person with the vision; you need somebody in overall charge	
6	Technology like photo-voltaic arrays, wind turbines and automatic switches are important as demonstrations to our students	
7	It's a good idea to have positive reinforcements such as 'green awards' built into our merit system	
8	Sustainability is about 'mainstreaming' behaviour – forming habits so that it's part and parcel of what the school does	
9	Energy is the most important component of sustainability; a sustainable school should aim to be as carbon neutral as possible	
10	Sustainability should be inbuilt so it's something that you do automatically, subconsciously, without thinking	
11	Sustainability should be spread equally throughout the school, involving *all* students	

12	Reducing costs, particularly energy costs, is the major impetus for being a sustainable school	
13	Sustainability needs to be prevalent across everything we do, otherwise by omission, we're saying it's not as important as other things	
14	People don't like Government edicts telling them what to do – and anyway, we know policies change every few years so one can work around them or simply wait them out	
15	Sustainability means facilitating pupil-led action, giving them opportunities to participate as monitors, watchdogs, committee members, etc.	
16	We shouldn't wait to be told what to do by Government because we're the professionals	
17	We should ensure that sustainability underpins all subjects right across the curriculum, otherwise it remains optional and can be missed	
18	All staff should be trying equally to integrate sustainability into their existing work even if things don't go as planned, it's innovating that matters	
19	Our main task is to give pupils experiences of the world beyond the classroom, that includes contact with nature and the world of work	
20	Sustainability should simply be part and parcel of what the school does; it's everybody's responsibility	
21	Sustainability is not about the 'bling' of technology, it's about the school ethos, such as being caring and sharing	
22	An effective approach is to run a 'name and shame' campaign to improve behaviour and for pupils to tell the teachers off!	
23	Thinking skills are the essential elements of learning for sustainability like independent inquiry, creative thinking, problem solving and working collaboratively	
24	It's important to look at the bigger picture; as a school we should aim for a holistic view of sustainability	
25	The aim is to develop young people that question, that want to change things; our young people should have their own opinion	
26	The main value of sustainability is as a vehicle for attracting young people who might otherwise be excluded or disaffected	
27	We've got to educate young people to be the ones who change things to make society more sustainable	
28	As a teacher, I'm not here to say, 'this is how it *should* be,' it's getting pupils to think about things	
29	Our goal has to be student achievement – Ofsted only benchmark us on whether children can read, write and count	
30	Spontaneous pupil-led action taking place around the school without any teacher involvement is a key indicator of success in a sustainable school	

Thank You

Appendix 4: Perspective Document Feedback Results

Perspective Document Feedback																		
Q Nos.	PD 1	PD2	PD3	PD4	PD5	PD6	PD7	PD8	PD9	PD10	PD11	PD12	PD13	PD14	PD15	Totals (n=11)	Dilemma Scores (Max. = 22)	
1	1		1	1	1		1	1	0	1	-1		1		1	8	*17*	
16	1		1	0	1		1	1	1	1	1		1			9		
2	1		1	1	1		1	1	1	1	1		1		1	11	*19*	
17	1		1	0	1		1	1	1	1	0		1		0	8		
3	1		1	1	0		1	0	1	1	1		1		1	9	*16*	
18	1		0	0	-1		1	1	1	1	1		1		1	7		
4	-1		-1	0	1		1	0	1	-1	0		1		1	2	*13*	
19	1		1	1	1		1	1	1	1	1		1		1	11		
5	1		1	1	1		1	1	1	1	1		1		0	10	*21*	
20	1		1	1	1		1	1	1	1	1		1		1	11		
6	1		1	1	1		1	1	1	0	1		0		1	9	*20*	
21	1		1	1	1		1	1	1	1	1		1		1	11		
7	1		1	-1	1		1	1	1	1	1		1		1	9	*8*	
22	1		1	0	1		0	-1	-1	-1	-1		1		-1	-1		
8	1		1	1	1		1	1	1	1	1		1		1	11	*18*	
23	1		1	-1	1		1	1	0	0	1		1		1	7		
9	1		0	0	1		1	1	-1	1	1		1		0	6	*15*	
24	1		0	0	1		1	1	1	1	1		1		1	9		
10	1		1	-1	1		1	0	1	1	1		1		1	8	*19*	
25	1		1	1	1		1	1	1	1	1		1		1	11		
11	1		1	1	1		1	1	1	1	1		1		1	11	*8*	
26	1		-1	-1	1		-1	-1	-1	1	-1		1		-1	-3		
12	1		1	-1	0		-1	-1	-1	-1	-1		1		-1	-4	*6*	
27	1		1	0	1		1	1	1	1	1		1		1	10		
13	1		1	0	1		1	1	1	1	0		1		1	9	*18*	
28	1		0	0	1		1	1	1	1	1		1		1	9		
14	1		1	0	0		0	-1	-1	1	-1		1		1	2	*2*	
29	1		0	-1	1		-1	-1	1	1	-1		1		-1	0		
15	1		1	1	1		1	1	1	1	1		1		1	11	*21*	
30	1		1	0	1		1	1	1	1	1		1		1	10		