CHAPTER 5

Sustaining Our Resources

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Introduction

Education for Sustainable Development (ESD) encompasses a complex and interconnected range of environmental, economic and social issues, and the concept of sustainable resources is no exception. This chapter firstly draws from a range of theoretical perspectives to frame sustainable resources. It then outlines the process of how the Postgraduate Certificate in Education and Certificate in Education (PGCE/Cert Ed) teaching team at Somerset College prepared to introduce the concept of sustainable resources to their student teachers in their first module. Finally, it guides the reader through lesson plan activities to show how this can be developed. The decision to focus on resources was taken on the team's co-operative inquiry journey to embed ESD into professional practice (see Chap. 3). Monthly reflections formed the basis of discussion points for our co-operative inquiry meetings.

Marshall, Coleman and Reason (2011) suggest that within action research we draw on many ways of knowing which involve many dimensions. We cannot simply see action research as a methodology. It is the way we think about things and our approach to research which leads us to carry out an inquiry. We should view it as:

> An attitude of inquiry [which] incorporates curiosity, a willingness to explore and articulate purposes, being willing to work with the idea that your own view may not be right or definitive, a willingness to explore oneself as a participant alongside others, and a scanning attention to potentially disconfirming evidence from a wide variety of sources. (Marshall et al. 2011, p.19)

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By disconfirming evidence, we might cite climate change sceptics for example or the denial or failure of governments to acknowledge or react to an urgent environmental or social need. It is the 'ruling relations' within the dominant ideology that Smith (1999, p.77) suggests regulate and control knowledge which becomes dominant and shapes our 'taken-for-granted' understanding about what is 'true' in society (Bourdieu 1977, p.170). This taken-for-granted understanding is not subject to reflection or reflective revision (Smith 1999, p.189). Sometimes it takes an environmental crisis such as the Exxon Valdez oil spill in Alaska in 1991, which killed 'more wildlife than any other human-engineered environmental disaster in U.S. history' (Braugart and McDonough 2009, p.36) and is still affecting the local community, to challenge these taken-for-granted 'truths'.

Smith (2006) suggests that in a global capitalist society, we are affected by the decisions made through powerful trans-local social relations that are organised and shaped elsewhere, passing through local settings, sometimes to the detriment of the local environment and its people. For example, sending e-waste away to developing countries in the South is not the end of the problem. Firstly, there is no such thing as 'away' because the life cycle of these products then becomes another community's responsibility. European Commission data shows that only 33% of e-waste is properly treated,13% is landfilled and the remaining 54% flows out of the European Union (EU) to the developing world (Laha 2015). Shipping waste southwards involves unregulated working practices with little regard to the health and safety of the labourers who dismantle the waste products, as well as risking damage to local ecosystems. Once these practices are accepted and consensus maintained, it obscures the power differences and inequalities which are at work within the hidden structures of power. Smith (2006, p.17) urges researchers to explore what lies behind local initiatives in order to understand the 'macro-institutional policies and practice that organise those local settings' within the hidden structures of power.

An example where we might accept taken-for-granted understanding is the present UK government promoting their nuclear power programme as a green and sustainable form of energy. We are told this is clean fuel but who takes responsibility for reprocessing and storing radioactive waste when there is no such thing as 'away' and we are passing the responsibility for safe storage on to future generations.

Box 5.1:

- Can you think of another example of how consensus is created and maintained?
- Can you identify in whose interest this lies?
- Would you agree or disagree and what would be your alternative?

Foucault (1980) suggests there are many forms of power but stresses the need to recognise how power is exercised rather than who holds power. He suggests power can be productive because it can be constituted through dialogue and discussion (Foucault 1980, in Ramazanoglu 1993, p.20). For example, as we bring issues linked to climate change into focus, we open it up for discussion and further examination—we have the power to bring it into 'discourse' which is productive power. However, this chapter draws on evidence to suggest how power can be both enabling and constraining.

Including myself as a participant in the inquiry meant that as a sociologist and feminist researcher with a history of campaigning for social justice and environmental health issues, I was able to bring to the group a certain 'attitude of inquiry' which would form part of the notion of many ways of knowing which 'include practical, experimental, representational, emotional, embodied and intuitive ways of discovering' (Marshall et al. 2011, p.18). Participating in this inquiry allowed me to explore what I know about myself—my values and knowledge about the world and what is known by other members of our inquiry team in relation to groups and societies, both locally and globally. We were able to gather together rich sources of knowledge which are intrinsically valuable and which can be 'deepened through attention to these additional means of coming to know our world' (Marshall et al. 2011, p.19).

Beginning the Process

Macy and Brown (1988, p.17) identify three mutually reinforcing core tasks in which many of us are engaged and which are essential to a sustainable future:

- Actions to slow the damage to earth and its beings
- Analysis of structural causes and creation of structural alterations
- A fundamental shift in world view and values.

From the start of the inquiry, we agreed that our focus on resources should be more than just a recycling exercise, for example, using double-sided handouts, ensuring our flipcharts are produced from recycled paper or providing resources through a virtual learning environment. Whilst acknowledging these things are important in sustaining resources, this is not where our responsibilities end. We also decided that like equality and diversity, sustainability should be threaded through our curriculum and not seen as a bolt-on extra. We considered how we could embed ESD in a meaningful way without causing our students additional work on top of their already stretched programmes. Sterling (2001, p.14) warns of existing difficulties in education that would add to our task:

> most mainstream education sustains unsustainability—through uncritically reproducing norms, by fragmenting understanding, by sieving winners and losers, by recognising only a narrow part of the spectrum of human ability to explore alternatives, by rewarding dependency and conformity.

Putting resources into the wider context of 'environment' raises many questions about how we extract and consume resources and therefore calls for careful scrutiny of the way we view consumerism in general. I considered it necessary to draw from a wide range of disciplines to inform our thinking in order to view resources in a holistic way. However, as Korten (1995, p.11) warns, we were not seeking simple, one-size-fits-all solutions to our problems:

> Whole-systems thinking calls for a scepticism of simplistic solutions, a willingness to seek out connections between problems and events that conventional discourses ignore, and the courage to delve into subject matter that may lay outside our direct experience and expertise.

An important factor that influenced my planning was a trip to India with Denise, another member of the team (see Chap. 4). Our experiences provided opportunities to see how other societies use resources or have limited access to resources. It was Sterling et al.'s (2005) 'linkingthinking' materials which provided the practical tools to start the process. The initial step was taken to prepare some of the activities shown in the lesson plan activities below. Starting from the micro by examining the use of classroom resources, we soon found ourselves moving like a camera lens, in and out from micro to macro and back again as the inquiry continued to raise questions and ideas. Our inquiry discussions equipped us with the

skills and knowledge to enter the global arena and explore ways of using resources sustainably, in the knowledge that we can participate in change for a healthier planet, becoming social actors in our inquiry.

The concept of sustainable resources has a wide focus in relation to climate change, encompassing air, sea and soil, not to mention the local environmental context in which they are sourced and the owners, employees and the local community involved. It was necessary to encourage our students to think holistically in order to consider the impact of extracting, producing and transporting these resources, not to mention their disposal after use. Making links between the resources we use in our teaching practice and the wider environment was a difficult first step because of the risk of minimising the importance of one over another. However, by working through the processes involved in the life cycle of teaching resources, we were able to start preparing the session that would first introduce ESD to our student teachers.

Making the Links Between Equality and Diversity and Sustainability

An important step was to recognise the new emerging global information economy does not exist in an abstract space but involves real communities linking global and local, sometimes referred to as the global–local nexus (Laha 2015). Through close scrutiny of the production, consumption and disposal of resources, we began to uncover how the organisation of economic production involves large-scale exploitation of certain markets at an international level, particularly where certain development programmes and strategies favour economic growth over people-centred development. It causes hardships for certain groups of people, particularly poor women who are underemployed, underpaid and undervalued and are mostly part of the informal economy, falling outside the regulatory realm of formal institutions. These women 'suffer from the additional burdens imposed by gender-based hierarchies and subordination' because they are dominant in 'food production and processing, in responsibility for fuel, water, health care, child-rearing, sanitation and the entire range of so-called basic needs' (Sen and Grown 1987, p.23).

Adopting Sterling's (2004) 'helicopter' view to look at the larger picture of the distribution of resources was vital as we began to realise that discourses of gender and race intersect those of the environment and social justice. The co-operative inquiry team responded to these ideas as our reflections began to take on board a more holistic approach to embedding ESD into our curriculum. As Shiva (1989, cited in Braidotti et al. 1994, p.173) states, we need

to challenge the values of Western bias embedded in notions of 'progress, prosperity and wellbeing' in development programmes, which she sees as an attack on people and their environment, especially women in the Global South who are 'ruthlessly exploited and incorporated into global markets'.

Through a process of reflections and team discussions, I started to map out how student teachers could formulate their own understanding of sustaining resources by working collaboratively to share with others and develop communities of practice across disciplines within the college. Encouraging students to think critically about resources, challenging their values and the dominant thinking influencing the global use of resources became a vital part of the process. Unless we illuminate the processes involved in the life cycle of resources, these activities will remain hidden and abstract. Taking a reflexive view of power is essential as we see how multinationals dictate the pace of how we consume resources that become an accepted part of our daily lives. We are constantly bombarded with information channelled through various electronic resources. This places demands on our time, but invariably we have little time to spend in deep reflection about the way in which we use these resources and how they are managed when we dispose of them. Becoming aware of the complexity of interconnectedness and the need for deep reflection helped us to be mindful of the challenges we face in order to make changes.

Moving from micro to macro we acknowledged reports that '12% of the people living in North America and Western Europe account for close to 60% of global consumption' (Worldwatch Institute 2013). If we compare this to the 3.2% consumed by one-third of the world's population living in South Asia and sub-Saharan Africa, then we can immediately see the unequal consumption of the world's natural resources. Taking this into account, the concept of an ecological footprint to measure whether a nation can support its resource consumption with its own available ecological capacity takes on new meaning. For example, the USA (largest user), with a footprint of 23.7 acres per capita, should have a footprint of 4.6 acres per capita in order to be sustainable. This portion of wealth is enjoyed at the expense of global natural resources and climate change (Worldwatch Institute 2004). We soon started to picture why the affluence of nations is associated with environmental harm.

The report *Our Common Future* (World Commission on Environment and Development [WCED] 1987) highlights the environmental inequality and racism which results from the export of hazardous materials to Global South communities, which is also a violation of the United Nations (UN) Stockholm Declaration, principle 21:

> States have … the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction. (UN 1972, cited in Pellow 2007, p.112)

Guinier and Torres (2002) take this one step further and refer to 'political race' to link race to ecology and social injustice. This forces us to challenge the toxicity of racism because it 'threatens us all' not only people of colour who may be directly affected by hazardous waste dumping but whole communities (Guinier and Torres 2002, in Pellow 2007, p.45). This concept provides news ways of thinking about the politics of race. An example of this is put forward by Pellow (2007, p.9) who believes:

> the global waste trade is a racist and classist culture and ideology within northern communities and institutions that view toxic dumping on poor communities of colour as perfectly acceptable.

Embedding the Concept of Sustainable Resources in Our Curriculum

The following activities were used to encourage students to explore how they could use teaching resources more sustainably. These activities can be used as a teaching tool to illicit ideas, apply practical applications, encourage critical thought and offer practical ways of managing a classroom discussion on sustainable resources.

Box 5.2: Session plan—Sustainable Resources.

Aim

- Exploring the use of teaching and learning resources and considering their sustainability

Learning outcomes

- Acknowledge the importance of sustainability in relation to teaching and learning resources
- Explore a range of resources
- Recognise the importance of resources
- Consider information and communications technology (ICT) as a resource and its contribution to sustainability.

Working in small groups the students were asked to define resource. Some students found the Webster's dictionary definition was limited or difficult to relate to 'a source of supply or support: an available means; a natural source of wealth; and a source of information or expertise; something to which one has recourse in difficulty', but as one student linked sustainability to the future generations of her family, she found more relevance in the definition set out in *Our Common Future* (WCED 1987) which calls for:

> development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

The activity began to draw on the values, priorities and changes necessary when thinking of future generations. The idea of sharing a common future meant moving towards a more ecological way of thinking as the students began to focus more critically on how resources were used in their teaching practice, in their subject specialisms and in their everyday lives and how this has changed over time and place.

In small groups, students were asked to make a list of teaching and learning resources and describe what domain they addressed, that is, cognitive, affective or psychomotor. The students were then asked to work in pairs on a communication exercise:

Box 5.3: Session Activity—Communicating meaning—words are not enough

- In pairs sit back to back, one of you will be given a picture, you have 3 minutes to describe the picture to your partner without actually saying what the picture is.
- The partner should draw what (s)he hears you describe.
- How does the drawing match the picture you described?
- What are the difficulties?

A series of visual images were used for this activity as an example of how we pass on meaning and the problems of interpreting things differently. We used a quote from Walklin (1990, p.78):

> We hear words but often have little or no understanding of meanings and concepts behind them. For words to have meaning they must be related to personal experience or to known concrete objects.

Building on Walklin's ideas to address the various domains of learning, we discussed the idea of how we come to make meaning. How do we reach a consensus of understanding and how do these ideas become part of our everyday language use?

After discussing how ICT aided the development of their teaching practice, students were asked to explore the life cycle of this resource by carrying out the following activity.

Box 5.4: Activity—Mapping out resources

- Think of a simple resource you might use in your teaching.
- Place this in the middle of your flipchart paper. On the left, draw or note all the materials you can think of that have been involved in producing this resource, e.g. fuels used to power machinery, materials that have gone into making it, buying it and selling it. Do they all come from the same place? What are the effects on land, forests, animals and plants, water, air atmosphere, etc.?
- On the right, draw or note the human activities that were involved in producing the item and getting it to you, where the workers live and what life might be like for them.

The students chose to research whether computers were a sustainable resource based on their assumption that computers were a sustainable resource. They gathered visual images and visited computer websites for their research before mapping out their findings to report back to the whole class.

As they began the mapping process, it became obvious that the production, consumption and disposal involved in the life cycle of computers involved many wider issues they had not considered at first. On the left-hand side, they mapped out all the materials mined to make computers such as tin, copper, gold and listed fuels such as oil involved in transportation, the energy consumption and labour involved. On the right-hand side, their mapping became more detailed as they discussed the wider implications of using labour for both the production and disposal of this resource. The issues involved more ethical considerations as they searched for companies that recycled their old computers. This led onto questions about where they were being recycled which led them to the Greenpeace (2009) website. Here they discovered that e-waste is routinely shipped out to the Far East, Africa and China, often illegally and often violating international laws. This

then led them to discuss how e-waste would be dismantled, what were the recycling operations and were they the same for the workers as they would be in the UK? They discovered that in developed countries, electronic recycling takes place in purpose-built recycling plants under controlled conditions. In many EU states, for example, plastics from e-waste are not recycled in order to avoid toxins and dioxins being released into the atmosphere. In developing countries, however, there are no such controls and recycling is done by hand in scrap yards, often by women and children.

This challenged students' values and taken-for-granted notions about how globalisation impacts everyday life in developing countries—particularly poignant were the video images of children amongst e-waste on the Greenpeace website and the visual images in Sophie Gerrard's (2006) MA project—invited some in-depth discussion around child labour and environmental exposure. The students used Gerrard's (2006) explicit photographic images to discover that the discarding of toxic e-waste has resulted in India becoming one of the largest dumping grounds in the world. This extremely toxic pile of waste grows each year as the lifespan of a computer has reduced from six years to just two.

By taking a helicopter view, the students have identified that race and gender intersect environmental justice as corporations shift many of the most toxic industrial hazard southwards. As Barlow (2003, in Pellow 2007, p.49) suggests, the distribution of resources is based on 'racial privilege' and unequal claims to housing, education, jobs, freedom and other limited social resources, based on an individual's 'racial designation'. The students explored how exploitation of human beings and the natural environment are linked to power and control of land, soil, seeds, metals and water which is in the hands of multinational global companies. Of course, they were aware of this from newspapers and television documentaries but they were always distanced from the events—there was no personal connection made until the in-depth exploration encouraged by this session. There was an abstraction of loss from their concrete experiences. As Harding (2006, p.51) points out:

> for most of us deep experience lies just below the surface of everyday awareness, and … a slight shift of context can easily make it visible. Deep experience is easily evoked, but its ethical implications are more difficult to assimilate.

Some students were shocked to find the environmental improvements being carried out under EU legislation, simply move the problems and responsibility of disposal to the Global South. Despite the Basel Convention agreement (2011), which set up a framework of control over the transboundary movements of hazardous wastes, this practice still continues.

Environmental protection in developing countries is usually poor and this, therefore, gives little incentive for manufacturers to prevent hazards 'downstream' during the product design stage which follows the 'cradle to grave' manufacturing model of the industrial revolution. Braugart and McDonough's (2009, p.3) suggest we need to rethink our production processes:

> cradle to cradle tries to put human beings in the same 'species' picture as other living things … a misuse of material resources is not just suicidal for future human generations but catastrophic for the future of life.

In order to support the electronic industry and, since many products are produced in Asia, Pellow (2007) suggests that e-waste dumping from consumers in the North back to Asia is viewed as a 'logical' part of the recycling process. Asian companies disassemble products after we have no further use for them. The 'take-back' scheme is considered a more efficient way of incorporating materials back into production. However, this may be due to the fact that recycling in Europe under EU regulations is more expensive than sending it back to Asia where e-waste is handled under hazardous conditions. As already discussed, those working in this industry face serious health risks, and ecosystems are damaged by the contamination of groundwater from hazardous substances, posing further environmental and public health risks (Pellow 2007).

The computer take-back campaign (GrassRoots Recyling Network [GRRN] 2008; Pellow 2007) holds that producers and brand owners should be responsible for the life cycle of their products, thus shifting the costs of managing discarded products away from taxpayers and local governments. However, the GRRN tracked a major electronics company's progress on recycling in the USA and found prison inmates were subject to chemical cocktails as they used hammers to smash computer monitors (Pellow 2007). Earning less than $2 per hour, the prisoners work outside the protection of labour regulations in the same way as workers in Asian e-waste workshops. After a public demonstration which drew attention to this practice, the company cancelled its prison contract. Now, these multinational companies are moving to support more recycling and financial responsibility which continues to be monitored by activist networks and eco teams.

Through education and campaigning, there are a number of ways in which action has been taken. For example, the 'Swadeshi' movement urged the boycott of many foreign goods (Weber 1999). The term 'Swadeshi' has been borrowed from the movement launched by Mahatma Gandhi against British-made goods during India's independence struggle. At that

time, Gandhi called upon the British to 'quit India'; now activists are calling on multinational corporations to quit India. Leonard (1994, cited in Pellow 2007, p.136) believes:

> Gaia has a vision of a just, toxic free world … we have the right to be a clean, chemical free environment; down to the level of the individual body … we want to shift the activist mindset from NIMBY (not in my backyard) to NOPE (not on planet earth).

Looking at power as productive or enabling, Marshall et al. (2011, p.95) illustrate how sustainability managers can affect change working from the 'inside' of corporations. An MSc student on a leadership for sustainability course tells how he joined a multinational company as a supply chain manager and following Macy and Brown's (1988) ideas, believed he could help create a positive effect in 'slowing down the train' in one of the world's most powerful corporations. Although these changes can be frustratingly slow, they are liberating.

During the session, the students explored a vast amount of data although some found it too much to take on board in such a short space of time. Reflective practice is not something you can switch on and off in an instant. It is a skill to be practiced and works on different levels of understanding and experience over time. With this in mind, I concluded the lesson with an activity that enabled students to practice deeper reflection. They needed time to consider how they could implement sustainable resources into their teaching practice. They were asked to reflect on their findings and apply these to their practice.

Box 5.5: Summary—key points.

Reduce, Re-use, Recycle

- These are three key words to think about in relation to resources and sustainability—take one of the resources you frequently use (these could be consumables such as timber or copper) and consider these three questions
- How can I reduce my usage of it without compromising learning?
- How can I re-use these resources?
- What happens to it after I have finished with it?

See http://www.recycling-guide.org.uk/rrr.html

There are tensions in sustainability education as there is no 'final grand narrative but an emerging nexus of thinking across a number of fields' (Sterling 2003, p.156). Importantly, this lesson has shown that with the right tools the awareness of student teachers can be gradually shifted as they take a step back and consider the bigger picture of how resources in their teaching practice can be used more sustainably. The activities created a focal point that allowed them to challenge the dominant world view and to move beyond their taken-for-granted assumptions.

The end-of-module assessments demonstrated how some students were able to make positive changes within their teaching practice. As they 'step out onto new ground' to experience 'a wider sense of self' (Macy and Johnstone 2012, p.81), only then will they begin to map out future challenges and recognise how they might continue to embed ESD into their programmes. However, this process takes time and space in any curriculum and students need to raise their own questions, and only through deep reflection will they discover new ways of seeing (Bateson 1972) how to use resources sustainably.

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Further Reading

Basel Action Network website http://www.ban.org/mission/ puts issues around e-waste in the spotlight and provides information which can be usefully developed to encourage learning about sustainable resources.
Sophie Gerrard's website https://sophiegerrard.com/work/e-wasteland/ provides useful teaching resources to encourage students to develop their understanding of e-waste and questions the sustainability of products we consume.
The Alliance for Global Sustainability website http://www.global-sustainability.org/ shows how the consumption of resources between West and East is unequal, but it also outlines possible actions to be taken to support global sustainability.
Somjita Laha's thesis at https://www.escholar.manchester.ac.uk/uk-ac-man-scw:263090 provides a comprehensive coverage of how e-waste is managed.
The following website http://www.recycling-guide.org.uk/rrr.html gives practical advice on reducing waste.