CHAPTER 11

Education for Sustainable Development in Initial Teacher Education: From Compliance to Commitment—Sowing the Seeds of Change

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Introduction

In the UK in 2010, David Cameron, the newly elected prime minister, claimed he wanted his coalition government to be 'the greenest Government ever' (cited in Randerson 2010, online). However, one year on, Jonathon Porritt (2011) reviewed their proposals in a report to Friends of the Earth and found little or no progress in the majority of them. The education system seems to have done little better as, according to Sterling (2009, p.105), education is 'a slow learner', a view echoed by Blewitt (2010, p.16) who argues:

> Sustainability literacy should by now be woven into the fabric of our educational culture. Our present ignorance and lack of engagement is nothing short of shameful.

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Although national and international policies suggest education is the key, Sterling (2011, p.18) questions the commonly held view that all learning is 'a good thing', as it may be 'at the service of questionable values and ends'. As Orr (2004) observes, colleges and universities have had a huge influence in promoting the domination of nature required for the industrialization that has caused the current environmental crisis. If we, as one of the advanced industrialized societies, are to learn to live more sustainably and produce and consume in a way which is less damaging to the environment, then we need to move from a limited focus on education for jobs towards a broader focus on building a society and economy which is ecologically sustainable (Sterling 2001). This requires a move from transmissive learning, which focuses on the efficient and effective transferral of information, towards Sterling's (2001) transformative approach which encourages a creative and deep awareness of different world views and promotes change (Sterling 2011).

Taking Up the Challenge

In 2007, an initiative to address Sterling's (2001) challenge to move towards a transformative approach to learning was taken by a team of initial teacher educators providing the Postgraduate Certificate in Education and Certificate in Education (PGCE/Cert Ed) for teachers in the further education and skills sector (i.e. post-compulsory further education, adult and community education, work-based learning), within Plymouth University's partnership of eight further education (FE) colleges. Changes in statutory requirements meant a revision of the PGCE/Cert Ed was required for September 2007 (DfES 2004), presenting an ideal opportunity to include an assessed learning outcome requiring student teachers to introduce Education for Sustainable Development (ESD) within their practice.

The team carried out a co-operative inquiry research project (Heron and Reason 2001; Summers and Turner 2011 and see Chap. 3) to encourage the professional and curriculum development required to support students in meeting this outcome. This democratic and participative approach enabled the team to develop into a collaborative community of practice in which they supported each other in developing the necessary knowledge, experience and values to confidently introduce sustainability to their students. The strong team ethos they developed supported them in tackling the difficulties and dilemmas they faced, as well as building on the successes they experienced, which led to the embedding of ESD throughout the programme. The author of this paper led the co-operative

inquiry (Summers and Turner 2011) and has seen the influence of ESD develop within her own, her students' and her colleagues' professional and personal lives. This raised questions about the influence on teacher educators (tutors) and student teachers (students) across the partnership and encouraged further research to:

- explore students' and tutors' conceptualisations of ESD, to gather a broad perspective on the different ways of making sense of what is Sustainable Development, and its role in Education, to identify what has informed and influenced this understanding;
- examine the stories of how this understanding has developed, and how it is affecting students' and tutors' personal and professional lives;
- develop understanding of how this may have been influenced by the introduction of ESD within the PGCE/Cert Ed.

Research Design

The decision was taken to develop case studies as this study is 'an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context' (Yin 1984, p. 23). In considering the influence of the introduction of ESD, it was important to collect data from the perspective of the students and the tutors introducing it to them. Questionnaires were sent to 441 students, who completed the programme in the 2009–2010 academic year, and 38 tutors. 22 responses were received from students and 13 from tutors, representing a 5% return for students and a 34% return for tutors. Although the response rate from students was low, on analysing their responses, it was evident they represented a range of views from those who appeared very committed to including ESD in their practice, to those who, at least initially, did not see its relevance in a PGCE/Cert Ed. Themes were generated and discussed with a critical friend who helped design the interview frameworks. A question had been included to indicate those willing to be interviewed and from those, a 'purposive' sample was selected to reflect a 'typical' range (Wellington 2000, p.59–60) of the views expressed. Seven students, who represented the range of responses, and six of their tutors were selected to participate in interviews.

Interviews, lasting approximately 30 minutes, were recorded and transcribed, and participants chose pseudonyms. All were asked the same open questions, as well as questions to explore their questionnaire responses. The transcriptions provided descriptive case studies of the perceptions of each participant. Alongside this process, a review of the literature was carried out

to identify relationships between the participants' responses and 'literature, policy issues or other substantive source' (Yin 1993, p.4), to be able to provide a descriptive analysis of individual conceptualizations of ESD and explore the influences on, and effects of, these.

The Conceptual Framework

Both ESD and sustainable development (SD) are contested concepts and invariably the word 'development' is at the heart of the debate (Stevenson 2006). SD has its origins in the environment but, in recent years, its meaning has evolved to include society and the economy (Jabareen 2008). The terms 'sustainable' and 'sustainability' are often used as if their meanings are obvious and value neutral, although there is little consensus on what should be sustained (Bonnett 1999). Although there may be benefits in the current ambiguity (Pezzey 1989 in Stevenson 2006), this may mask the intentions of policy makers who appear concerned about the environment but are actually focusing on economic growth (Rist 1997). Even the Brundtland report (World Commission on Environment and Development 1987) emphasizes the need for economic development to reduce poverty in the Third World, and 'deemphasizes the environment' (Jabareen 2008, p.181). However, when there are so many in the world suffering from a lack of development, it would seem 'both unjust and unrealistic to expect them to remain so' (Bonnett 1999, p. 314). Nevertheless, if such development requires even greater levels of extraction of scarce resources, then SD is an oxymoron as, according to Harding (2006, p.232):

> sustainability and development are contradictory concepts and 'sustainable development' is just economic growth dressed up in the language of deliberate obfuscation, used knowingly or not by those who care nothing for the Earth in order to fool us into thinking that they are taking her concerns seriously.

In what could be termed the 'over-developed' world, it is important to guard against potential abuse of this ambiguity, as there is a need to sustain 'that which is valued, but which is currently endangered through depletion, pollution and so forth' (Bonnett 1999, p. 313). However, Rauch (2002, p.48) considers the ambiguity:

> implies that the contradictions, moral dilemmas and conflicting targets inherent in this vision need to be constantly renegotiated in a process of discourse between the players involved in each and every concrete situation.

If this is the case, then when introducing ESD, the recognition that there are no easy answers to current dilemmas, provides the opportunity for critical debate amongst students and teachers alike. However, as Jickling (1992, p.8) argues:

> Education is concerned with enabling people to think for themselves. Education "for" sustainable development … or education "for" anything else is inconsistent with this criterion.

Although recognising the importance of developing students' critical thinking and encouraging a rational understanding of the issues involved, Bonnett (1999) questions the viability of incorporating democratic values into any consideration of ecological sustainability. As Ophuls (1977, cited in Bonnett 1999, p.214) argues 'liberal democracy as we know it … is doomed by ecological scarcity'. Bonnett (1999, p.318) considers the ambiguity of SD to be problematic and at worst may become 'a term of political convenience used to mask and/or legitimate vested interests'. He argues that interaction with nature is central to our self-identity and, if teachers view sustainability as a 'frame of mind', this could have wide-ranging educational benefits and allow the whole curriculum to be seen as a medium for embedding environmental education. Huckle (2012, p.36) considers that as such a frame of mind recognises society's impact on nature, then social and economic development would be limited by ecology and would encourage students to develop:

> a deep empathy towards the flourishing of things beyond themselves. They will need to be open and engaged with the complexity and meaning of things in the manner of great art or literature; attuned to the harmony and discord in the world via a heightened sense of attachment; and capable of viewing nature in ways that are essentially poetic and non-manipulative.

This could address a concern of Kopnina (2012) that the shift in environmental education towards ESD has resulted in a radical change from an ecocentric focus towards a focus on social issues and the fair distribution of resources. Although this encourages recognition of a moral obligation to those in poverty, there is less emphasis on caring for other species and ecosystems. However, Stevenson (2006, p.286) cautions against:

> divesting us of our humanity in not recognizing our unique capacity to construct views of reality or worldviews which themselves must in some sense be anthropocentric.

Using Bonnett's (1999, p.322) 'strong' *and* 'weak' versions of anthropocentricism helps to develop this point. Both versions accept that to confer or recognise values requires the level of consciousness of human beings. However, the strong version leads to the assumption that human beings are the only 'bearers of intrinsic value' and therefore the dominant species. In contrast, the weak version suggests:

> it is perfectly intelligible, and … much closer to some aspects of our experience of nature, to allow that an essential part of human awareness is its capacity to recognise the intrinsic value of the 'other', indeed to be capable of a deep respect for things non-human and that are not perceived as primarily serving human purposes and, indeed, on occasion precisely because of this. (Bonnett 1999, p.322)

Huckle (2012, p.36) argues for an ESD or 'learning for sustainability' which is more realistic and considers politics, as well as values, and is:

> [m]ore alert to issues of inequality, social class, and sustainability politics; more firmly anchored in the realities of the dominant forms of unsustainable development and underdevelopment shaping the contemporary world; and more attentive to the struggles of the workers and citizens to introduce more sustainable alternatives.

He builds on Bonnett's (1999) foundation of sustainability as a frame of mind and moves through sustainability ethics to political economy to encourage the development of democratic classrooms which, through direct experience, encourage learning about equality, democracy and sustainability. Students would consider:

> how social, environmental and ecological relations have changed over time; the benefits and costs of capitalism in its diverse forms; the validity and viability of different kinds of reformist and revolutionary change proposed by diverse social movements; and the desirability of people acting collectively and successfully to shape and change their own natures and the natures that surround them. (Huckle 2012, p.43)

To this end, Stevenson (2006) calls for academics and researchers to engage teachers in ESD, as they have much to contribute with their knowledge of their subjects, their students and their localities. They can encourage the necessary connections to be made with their students' lives and

experiences, in a way which fosters their need for hope and a sense of purpose in their learning. Some points of reflection are suggested in Box 11.1.

Box 11.1:

Reflect on your students, your subject specialism and your local community. How can you use this knowledge to introduce your students to sustainability and help them to make the connections with their lives and experiences in a way which encourages a sense of purpose and hope for the future.

Smyth (1995, in Stevenson 2006) argues that the healthy state should be presented as the norm, with problems considered in terms of how they should be corrected. Although this is supported by teachers with concerns about the effect on students of a focus on environmental disasters (Cross 1998), it does not follow that a positive focus is sufficient to motivate learning (Brophy 1987, in Stevenson 2006). Of more importance is engaging students in work which is challenging and connected to their own lives in order to encourage a sense of ownership (Stevenson 2006). As Selby (2007, p.249) argues 'the heating is happening' and calls for 'education for sustainable contraction' in which we accept the climate change threat and move away from the current denial.

To contribute to an understanding of the transformative approach necessary for this, Sterling (2011, p.19) draws on Bateson's (1972, in Sterling 2011) concept and models of zero, first, second and third levels of learning and change which relate to the quality and depth of the learning experience. Tosey (2006) describes Bateson's zero level of learning as 'responding to stimuli but making no changes based on experience or information'. The concerns of Dawe et al. (2005), Sterling (2009) and Blewitt (2010) suggest that education in general may be languishing at this level in relation to ESD. Sterling (2011) summarizes the different levels of learning and change in the following Table 11.1, with the arrow representing a move towards the higher-order learning required for transformation:

It is Bateson's (1972, cited in Sterling 2011, p.23) third level, involving 'a shift of epistemology or operative way of knowing and thinking that frames people's perception of, and interaction with, the world', which is required in order to challenge current ways of thinking and acting. As Sterling (2011) suggests, although moving from first- to second-order and from second- to third-order learning and change can be inspiring, it

Table 11.1 Sterling's (2011) levels of learning and change

Orders of change/ learning	*Seeks/leads to*	*Can be labelled as*
First-order change Cognition	Effectiveness/efficiency	'Doing things better' Conformative
Second-order change Metacognition	Examining and changing assumptions	'Doing better things' Reformative
Third-order change Epistemic learning	Paradigm change	'Seeing different things' Transformative

Source: Sterling (2011, p.25)

may also cause student resistance, as it can be challenging and threatening to question existing beliefs and assumptions. As Selby (2007, pp.10–11) argues, the transformation necessary will require educators to support students in addressing the 'despair, pain, grief and loss' which may result. However, this may be difficult for educators who are working within a policy context which promotes sustainability on the one hand, but high economic growth and consumerism on the other. As most formal education is concerned with first-order learning, this presents major barriers to educators attempting to encourage higher levels of learning and change (Sterling 2011), demonstrating the challenges ahead for the team of initial teacher educators as they started their project in 2007.

The Role of Teacher Educators in Encouraging Education for Sustainable Development

In considering how teacher educators can encourage ESD, Martin et al. (2007) suggest a professional values model that moves beyond individualism, performativity and compliance:

> towards one where democratic values, communities of practice, sustainable economies, sustainable communities and social justice are embedded. (Martin et al. 2007, p.358)

Although Avis et al. (2002) note that FE student teachers have empathy with notions of social change and justice, these concerns are limited by a narrow view of teaching as a technical process unconnected with the wider socio-economic and political context of post-compulsory education

and training. Summers (2005) found that the reflections of FE student teachers are mostly technical and practical, although the influence of the PGCE/Cert Ed is enabling some to become more critically reflexive. She suggests this should be further encouraged by teacher educators, as engaging in only practical reflection can lead to an unquestioning acceptance of demands placed upon the individual. Developing this critical approach should encourage 'the recovery of a politicised critical pedagogy' (Avis and Bathmaker 2004, p.15), which may support Huckle's (2012) call for a more realistic approach to ESD. Engaging with a professional values model, such as the one proposed by Martin et al. (2007, p.359), should encourage the development of teacher educators as a 'community of practice' of 'engaged public intellectuals' and 'agents of change' who are committed to developing student teachers who can extend their ethics of care (Avis and Bathmaker 2004; Summers 2005) to make the connections with ESD and become 'agents of change' themselves.

In recognising the institutional and personal barriers educators and their students face in working towards such a paradigm change, it is bound to be a difficult journey. It may be that an initiative such as the one resulting in the research discussed in this chapter, only encourages the first steps in this journey. However, as Sterling (2011, p.30) recognises:

> transformative social learning – albeit reactive – whether precipitated by energy price shocks, health scares, terrorism or global warming for example, is already with us, shaking public assumptions. Under such conditions, it behoves academe to be anticipative, to re-examine how it can move towards more transformative, more socially engaged and future oriented models of teaching and learning that can nurture positive personal and social development.

The team who embarked on this action research project took a democratic and participatory, co-operative inquiry (Heron and Reason 2001) approach to developing themselves, their practice and their curriculum and supported each other in their individual and joint development (Summers and Turner 2011). They drew on support from the Centre for Sustainable Futures at Plymouth University and in turn supported partnership colleagues in developing their own and their students' practice. To discover whether this team can be considered to have been agents of change and whether there has been any progress towards a more anticipative and transformative approach in their students' and colleagues' teaching, the following section analyses the responses of participants to investigate the effects of the introduction to ESD.

Analysis and Discussion of Findings

In analysing the student and tutor questionnaires and interview transcripts, the different responses suggest a wide range of levels of learning in relation to ESD. The analysis enabled the identification of themes which are discussed in the following subsections and links have been made to Sterling's (2011) levels of learning and change and with the theory explored in the literature review.

Perceptions of ESD

Participants' understanding of ESD ranged from the majority who focused on the environment, to those who included social and economic conceptions. Dawn felt teaching should include 'the reality of needing to recycle and reuse all and everything to permeate all of our work' and Paul explains how 'our influences can change the world for the better'. Lorraine understands it to be 'the promotion of green issues' and the 'sensible/frugal use of resources'. In Sophie's teaching, she includes topics about recycling and saving money on energy use. Imogen teaches Early Childhood Education and although some topics taught come within the ESD agenda, that is, poverty, waste, war and Forest School sessions which encourage environmental awareness, she had not made the link with sustainability until being introduced to it on the PGCE. Although unsure at the start, she has since been influenced by the media and her personal travelling which has encouraged her to develop her practice further. Harry's understanding of ESD was originally limited to 'back-to-back photocopying and turning the lights off when you leave'. He feels it can *be* 'a slippery concept to get across to students and as such I'm not always sure if I have'. He recognises areas of ESD which are very important and 'cannot even begin to imagine how I can influence them'.

Effie recognises the ambiguity of the concept and the confusion this can cause, but feels this is 'necessary given the various global, local [and] regional perspectives'. However, as Rist (1997) cautions, there are risks to this ambiguity and constant debates on the definition can lead to 'paralysis by analysis' (Fien and Tilbury 2002, p.3) undermining progress towards a sustainable future.

Sarah considers it wrong to simply focus on the environment as she feels ESD should consider the 'sustainability of communities, organisations, departments, courses and staff and students'. However, there could

be a danger in separating elements of ESD, particularly if this leads to Kopnina's (2012) concern about a shift from an ecocentric focus towards an anthropocentric focus. Alex recognises the relationship between the different aspects of ESD which:

> encapsulates a culture towards recognising human potential and interdependence of the world we inhabit. It should be a way of being, implicit to our daily lives, the well-being of the world.

This corresponds with Stevenson's (2006) view that as human beings we can construct world views which, to some extent, will be anthropocentric but, as Bonnett (1999) suggests, not only serve our purposes but also demonstrate a deep respect for the well-being of things which are other than human.

Culture of Compliance: First-order Learning and Change

The growth of regulation in FE colleges, since incorporation in 1993, has increased what has been termed a 'compliance culture' (Hadfield and Atherton 2008, p.1). A consequence of this has been a rise in risk-averse managers exerting close control over teaching staff, resulting in a similarly risk-averse approach to teaching (Coffield 2008). This can be seen in some of the participants' responses. One said 'I haven't got the authority to teach my own personal theories' and another confirmed the introduction to ESD had very little influence on their practice as it was 'not part of mainstream education or our curriculum'.

Another example is Bill who, since completing his Cert Ed, had not introduced sustainability to any subsequent groups of students. He teaches literacy and numeracy to construction students and, to meet the ESD outcome, planned a project which involved students researching a topic of their choice on sustainability to present to their peers, demonstrating their communication skills. He was delighted with their response:

> they knew more than I did and they were all really switched on to it … when the presentations were being given, no-one was speaking, and I wasn't at the back threatening. I was just at the back watching and everyone was watching … the different angles they came from, that I hadn't even considered … one of our weaker students … started giving us all this information and it was fascinating.

Bill is under pressure from his college to get results from his easily distracted students and so he tends to focus on what they 'need to know' to pass. Even though the sustainability presentations had engaged the students and encouraged 'fascinating' presentations and met the criteria of what they 'need to know' in relation to their communication skills, when there was no requirement to include sustainability, he did not. Lorraine was also compliant in terms of meeting the outcome but not following it up afterwards, as she considered ESD was not essential to her students.

Sarah, a tutor, had been keen to research ESD and introduce it to her students to enable them to see the 'bigger picture'. However, when her college changed to a different provider, with no such outcome, their focus on ESD was considerably reduced:

> it's covered a little bit in Year 1, but it's not a big part of the programme, so it's almost us playing lip service … it's a lost opportunity … we could possibly have done more to build it in there.

These responses suggest Sterling's (2011) first order of learning and change in terms of doing existing things better with an emphasis on efficiency and effectiveness. The concern with this conformative approach is that when the impetus to include ESD is taken away, there is a danger of the initiative being sidelined.

Overcoming Initial Anxieties: Moving Towards Second-order Learning and Change

ESD as a 'bolt-on'

Sarah and John were concerned about including ESD alongside the many *top-down* policies already required in the PGCE/Cert Ed. Initially, John found there were 'factions' within the groups; some were converts who recognised the importance of ESD and others who were quite negative. He compared it with 'equality and diversity' which at first was introduced as 'some sort of bolt-on', which may be how ESD might now be perceived. He considers the negativity may have been increased due to his lack of confidence in introducing it in 'a meaningful way'. His confidence is now much greater and he feels he is an 'advocate' of ESD and 'planting seeds':

> For me it's about creating that sort of ethos within … 20 trainees, they go and talk to their trainees and … when their trainees or learners go off and have a business, they might think ethically about their business.

Lack of Understanding

Elizabeth remembers it being embarrassing at the start 'because it's a value laden area and … there wasn't a general understanding of the potential of SD and the role of ESD'. As the focus seemed to be 'mostly environmental' and the issues were 'hugely contested' and some had a 'fairly cynical view', she felt she had to say:

> I'm not saying to you that this is exactly what you should be getting involved with, but these are issues that will have an impact in the years to come and it is a growing area of concern.

At the time, she was concerned about 'tackling people's personal value bases' and introducing something which, she felt, had not been sufficiently critiqued. However, in the main they were 'at least accepting and willing to engage with it, if not positive about it'. Now she feels students are more positive and saying 'yes, I couldn't agree more'.

Head in the Sand

Effie found some students were reluctant to engage, commenting:

> I don't want to know that there's this stuff going on, I've got enough on my plate already thank you.

This was also experienced by the original team as one of their students felt she 'just wanted to bury her head in the sand and hope it all goes away'. This confirms Selby's (2007) view that encouraging the transformation required may cause anxiety and despair and teachers will need to support students in coming to terms with this. Although it may be challenging and threatening, as Stevenson (2006) suggests, teachers have the necessary knowledge of their students, their subjects and their localities to make purposeful connections with ESD which should foster their students' need for hope and may help to counter the anxiety and despair.

Preaching or Practising?

Alex was concerned about sounding 'evangelical', which was also experienced by members of the original team when first introducing it to students and colleagues. Interestingly, John, one of those colleagues, admitted feeling this, 'but then my intelligence kicks in and I think "no she's not, she's saying some quite good stuff"'. This relates to other anxieties expressed, which were almost apologetic about introducing ESD. Elizabeth felt embarrassed, Harry and Alice were concerned about lack of knowledge and John and Sarah felt it was yet another addition to the programme, along with other statutory requirements. Sarah was also concerned about 'appearing to be hypocritical and condescending' due to a concern that as she was introducing ESD, she should set an example and model sustainable practice. Alex was concerned about being a hypocrite in her personal life:

> It is no good doing things externally because you're told to do it. You actually have to internalise those values and I think I'm definitely beginning to internalise those values.

John was also concerned about this and admits being 'more theoretically sound than practically achieved. Sorry', demonstrating the guilt feelings to which this can lead. This was noted by the original team, as there were criticisms from students about not practising what they were preaching, due to the vast amount of paper required to meet programme requirements:

> Although these comments were few, they caused anxiety as we were wary of being perceived as 'preachers' and not as 'good' role models, both of which strike at the heart of the values which underpin our professional practice. (Summers and Turner 2011, p.461)

Many tutors felt anxiety when introducing ESD for the first time. Alice was concerned about her lack of knowledge and it was only when she found out more that she recognised 'I did know quite a bit, I just didn't realise I knew it'. As with Harry, she feels she and her students have learnt together. Harry is now more confident in his approach and always tries 'to go from a values base rather than a preaching practical base'. However, as Harry and Alice found, introducing ESD led to tutors learning alongside students, which was also experienced by the original team as it:

> reinforced the importance of us not setting ourselves up as 'experts' but rather as being on a journey, which we hoped our trainees would join. (Summers and Turner 2011, p.462)

There will be dilemmas along the way, but together tutors and students can explore these and the factors influencing the decisions to be taken, deciding on the most appropriately sustainable way forward. This suggests a reformative movement towards Sterling's (2011) second-order level of learning and change, where both tutors and students are examining and changing their assumptions in order to do better things; learning together in a way which may not have happened before.

Our Responsibility as Teachers: Evidencing Second-order and Creating the Potential for Third-order Learning and Change

Teacher as Expert?

Although some teachers may be influenced by the need to be compliant, other responses suggest a range of influences on professional practice. Harry started introducing ESD in a 'perfunctory' way to meet requirements, rather than 'what I would call the deeper stuff, change of mindsets and things like that'. He felt most of his students had a similar understanding and they developed 'an uneasy truce' when he admitted he was not sure what he was doing. Harry's students were from the military and they have a 'very authoritative role' and a 'very fixed view' about the role of a teacher. Due to Harry's awareness of their views of teachers who do not know their subject:

> that then becomes a script or a manifest within myself, which probably spurs you on to go and find out more information so you are one step ahead. Not because you necessarily want to know the information, you just don't want to look a fool.

He felt their developing knowledge 'was limited in size by my knowledge'. However, through him developing his knowledge and encouraging those familiar with ESD to share theirs:

> someone bites and gets enthusiastic, and you think 'thank god for that' because I have now got somebody who can make that connection. And yes, it does start to spread out.

This made him more confident about admitting he 'doesn't know something'. He now has 'confidence in something I'm not confident about and I actually use that lack of confidence or lack of knowledge as a teaching device'. This is taking him away from the need to feel that as a teacher, he has to be

the expert. It is this which is suggesting second-level learning and change as he examines and challenges his assumptions, with the potential to move on to third-level learning and change, as he 'sees things differently' and encourages this in his students, as they all learn together.

Bottom-up or Top-down?

John sees the importance of a bottom-up process:

> by embedding the basic principles [of] economic, social and directly environmental sustainability issues in our teaching practice and curricula, a growing awareness will occur within society. We therefore have to model sustainable teaching and ensure sustainability issues and links are highlighted … where possible.

This is also the case for Dawn, who takes as many opportunities as possible to embed ESD in Performing Arts, as 'we have only got the one planet … and if we mess it up, we have nowhere to go'. She has developed projects with her students exploring waste, recycling, poverty, consumption and community relations within the local community and further afield. This confirms Stevenson's (2006) view that educators have much to offer with their knowledge of their subjects, students and localities, encouraging a sense of hope and purpose in their learning.

However, this contrasts with Bill, who has become disillusioned and feels action from the top is also required:

> What's the point when no-one is taking [it] seriously. Education is paying lip service! There is no concerted effort in this college for sustainability.

For ESD to be effective, there must be a link between the curriculum and the institution's approach to sustainability, otherwise it is 'contradicted by the students' daily experience within the institution' (Dawe et al. 2005, p.23).

Effie clearly remembers her group's introduction to ESD as everyone was enthused and really engaged. They were:

> bouncing ideas off each other … doing presentations on ESD and our own role, which I think was really interesting for people, because the ones that were struggling with that, kind of just said, 'here's what I do, can you all tell me what I can do' which was really good. I think we got more out of that because we were all there just as individuals.

This confirms the importance of students and teachers supporting each other in developing their practice, as was the case for the original team in their co-operative inquiry (Summers and Turner 2011). As Effie said, 'it really made my PGCE' and encouraged her to go on to a Master's in Education for Sustainability. She now introduces it in her teaching by including articles on sustainability when covering study skills or encouraging debate and when teaching about mass media in social sciences, she has encouraged discussion about aid and media's representation of Africa, to encourage a global perspective. She has been pleased to see some students, who had no prior knowledge or interest, have chosen to do research projects based on sustainability.

Rising to the Challenge of Ambiguity

Alex enjoyed the challenge of introducing ESD as she has always believed in what she calls 'the grey areas of professionalism' for which there are no easy answers:

> I was familiar with that ambiguity and I suppose I like ambiguity in teaching because it always gets students looking and thinking.

Although at first she found students were surprised at the introduction to ESD, this is now less apparent. Alex considers 'teaching is a work of heart and you've always got to care' and it is important to keep emphasizing why ESD matters. She recognises the need to encourage change as a teacher:

> Attitude changes only occur if you've actually been able to weigh up the pros and cons, which is partly why I do that in teaching. I allow them the latitude to go up one way, then go up the other and then come to some sort of resolution because that's how you can deal with conflict.

Elizabeth recognises the need for good stewardship of the earth, but is reluctant to impose this on others as 'it's one thing to share that with somebody, but to actually make it part of a taught programme is tricky'. She feels moving away from the 'purely ecological and environmental' into the 'other realities of being humans on the planet, has made it easier to engage with'. In the last five years, she feels education's role in sustainable development has become clearer and more mainstream.

Nevertheless, as with Jickling's (1992) concern about indoctrination, she is aware of potential dangers:

> Without a questioning and enquiring approach patterns of behaviour can quickly become entrenched and thoughtless – dogmatic, even.

When Harry reflected on his current commitment, he posed the question, 'how do we know we've actually committed to it' or if 'we're just complying'. He thought a good test for him was that 'if they said you don't have to do the SD teaching anymore, I think I'd still like to do it'.

These examples suggest Sterling's (2011, p.25) second order of change, moving towards being reformative, encouraging students to start challenging their beliefs and assumptions and 'doing better things'. The potential to move on to the third level of learning and an anticipative, as well as a transformative approach, has been considered by Elizabeth:

> I did toy with the idea of seeing whether we could actually re-write the whole [PGCE/Cert Ed] … based on sustainable development … it would include ESD, but as a programme it is actually modelled in its behaviour … because if we were going to be truly radical we shouldn't be teaching people to teach subjects, the train of thought seems to be heading in the direction of 'we will stop teaching subjects and actually we need to be developing citizenship and survival and flexibility and all of these other sorts of personal attributes'.

The focus of the programme would be:

> you are training people, you are teaching people, you're working with people who are going to be working in jobs that at the moment don't even exist.

As she recognises, this would completely change the perception of what a PGCE/Cert Ed is trying to do. It would be preparing teachers for 'a future that we don't know yet. Not for sustaining a future that we already possess.' This could potentially be radical, anticipative and transformative. As Effie states:

> I am passionate about ESD, but the more I learn, the more I realise that the spectrum is so vast!! Becoming an agent for change is vital.

Box 11.2:

Consider how you can become an agent for change and encourage this in your students as they move into employment. What support can you access, who can your work with, what will be your first steps? Reflect on possible approaches you might use to research such developments.

Conclusion

As can be seen, the effects on students and tutors of the embedding of ESD in our PGCE/Cert Ed have varied in degrees from compliance to commitment. There is some evidence of Sterling's (2011, p.25) first-order learning and change in those who were conformative and simply complied in order to 'do things better' and meet the PGCE/Cert Ed requirements.

There is more evidence of Sterling's (2011) second-order learning and change in those starting to examine and challenge their assumptions and 'do better things'. Most of the students have continued to include ESD following their PGCE/Cert Ed and some are developing this further as they have become more familiar with the agenda since completing the programme.

Although a few reactions from students were initially negative and non-committal, the main response has been positive and now the majority of students are unsurprised to have ESD included in a PGCE/Cert Ed. All the partnership tutors have continued to develop their knowledge and understanding of ESD in order to support their students in meeting the outcome, as well as making efforts to make additional links throughout the programme.

There are glimmers of Sterling's (2011) third-level change, as some of the tutors and students are beginning to 'see things differently' which could lead to the transformative and anticipative approach required. This suggests there is the potential to encourage a 'politicised critical pedagogy' (Avis and Bathmaker 2004, p.15), which could provide the more realistic approach to ESD which Huckle (2012) requires.

The introduction of ESD has encouraged teacher educators and student teachers to develop as a 'community of practice' enabling them to make the connections between ESD, their subject specialisms and their students' lives and experiences, thereby encouraging the hope and sense of purpose needed for learning (Stevenson 2006). This will support the development

of both the teacher educators and student teachers as 'engaged public intellectuals' and 'agents of change' (Martin et al. 2007, p.359) with the potential of encouraging this in the students of the student teachers too.

From initial compliance to commitment, it is clear that seeds of change have been sown within our programmes. As the original team found and Sterling (2011) confirms, there are many obstacles to overcome in striving to encourage second, let alone third-order learning and change. However, the second-order learning achieved in this project is a good step forward and in a highly regulated, intense and short programme like the PGCE/Cert Ed, it may be a more realistic goal than the radical shift of world view which is required for third-order change. It is important for us to continue developing our practice to consolidate the second-order learning and change that has been evidenced. By continuing to be agents for change, this may be the stepping stone necessary to encourage a move towards 'future oriented models of teaching and learning' (Sterling 2011, p.30). It is this which could encourage the transformation necessary to prepare student teachers for the unknown challenges in a sustainable future.

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