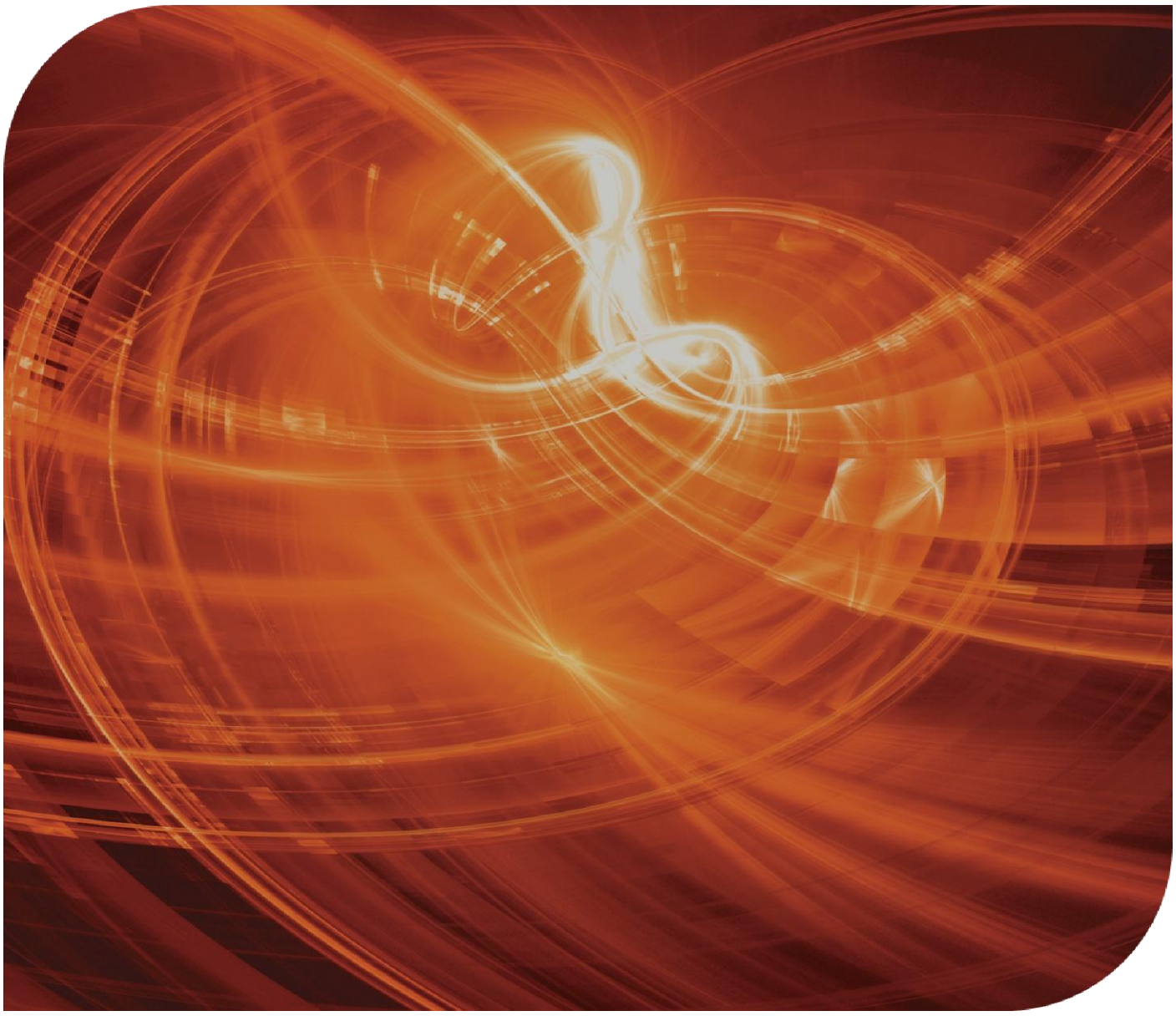
Embedding Sustainability into Teaching, Learning and Curriculum in the learning and skills sector

LSIS
LEARNING AND SKILLS IMPROVEMENT SERVICE



July 2013

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It has been produced for the sector with the help of the sector. It is with thanks to those organisations and individuals involved, to attend workshops, be interviewed, or complete the survey, that this research has been possible.

Adult and Community Education, FE Colleges and Work-based Learning

A4e
Adult and Community Learning - Bracknell Forest Council
Adult College Barking and Dagenham
Basingstoke College
Bicton College
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City College Plymouth
Colchester Institute
East Surrey College
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Totton College

Stakeholder organisations

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- everyone else that offered to host workshops, or do interviews that we just couldn't fit in.

The research journey

This research project proved to be a substantial undertaking, in part due to the excellent input we received from the FE & skills sector and from the sustainability community, and this depth and breadth of input has made writing the report something of a challenge.

Below is a guide to the research journey and to the report, which may help you to see the process and find your way around the report.

Underlying principles

The key underlying principles for this research were to:

- Be open to complexity - it would have been simple to pick five skills, see who feels they have them, and propose a workshop format (to which people "agree" to wanting) as the solution. We ask people to be open to complexity, as a core part of sustainability, and so have practiced this in our research.
- Honour opinions and reflect what the sector has said - this is a report for LSIS, a body funded by BIS, a department of the UK government. Yet the report includes comments that may not usually be seen in a government-funded report. This principle to truly listen and report on the barriers and concerns of the sector was considered a brave yet necessary element of the research, to ensure the sector is supported in ways that it really needs.

Research journey

The report starts with an **introduction** to the project and to the context in which it was conducted.

In Section 2, the **research methodology** outlines in detail how the research was planned and accomplished; and why the methods used were chosen.

Section 3 looks at **what sustainability is** and the suitability of definitions in use; and reflects on what the sector understands by the term 'sustainability'.

Questioning why teaching staff would embed sustainability, in Section 4 we go on to look at what is actually driving the agenda along. This was looked at through desk research, as well as asking survey participants about their understanding of **drivers for embedding sustainability**.

In Section 5, we explore **what effective practice is already in place** in the sector. How is sustainability being embedded? What approaches are being employed? What subject areas does sustainability feature in? And how can organisations learn from examples elsewhere in the sector?

In Section 6, we look in depth at what should actually be embedded. What is the purpose of embedding sustainability into **teaching, learning and the curriculum**? Is the effective practice that is already happening enough? What does success in this area look like? We

draw on emerging research on what competences learners require, and investigate how these can be taught.

Section 7 seeks to understand, with the knowledge of required learner competences, what the **teacher competences** are. What do teaching staff need to know? And **what support do they require** to work effectively with their learners?

Barriers and solutions are explored in Section 8 to understand what is getting in the way of embedding sustainability as perceived by the sector, and what solutions to these the sector proposes.

Leadership is key to progressing this agenda, so Section 9 is devoted to this topic.

The report ends with recommendations: for teaching staff, drawing on what has worked for others; for institutions; and for whoever picks up this inquiry in the future.

The discussion should not end with the publication of this report, it needs to continue and flourish. As a continually evolving field of inquiry, in a continually changing sector, keeping this inquiry alive is key.

1 Introduction and context

This research report was commissioned by the Learning and Skills Improvement Service (LSIS) at the end of January 2013. It had, however, been conceived well before the announcement that LSIS would close at the end of July 2013. The aspiration is that this report will serve as a practical resource to the sector post-LSIS. This is why the report has been written for the sector and, by capturing and reflecting the experiences and opinions of sector leaders and practitioners, by the sector itself.

The interest in this work, and in this report, has been excellent. Colleges, adult learning providers and work-based learning organisations have shown overwhelming support for this research. They have generously participated in workshops, focus groups, exploration session, personal interviews and the survey. Stakeholder organisations and experts in sustainability and learning and teaching have likewise generously given their time. The Institute for Learning has hosted the survey and untiringly supported and helped with analysis. All of the conversations, workshops, survey and research analysis have contributed to this exploration of what it means to embed sustainability into teaching, learning and the curriculum.

This exploration has surfaced a myriad of threats and opportunities for the sector. People often experience a feeling of despondency, countered by the great enthusiasm of those in the sector who are doing the work already and by a shared awareness of why this work is so essential. Far from being just another initiative, sustainability is a principle that is here to stay. Worries that have emerged include: a lack of policy drivers; funding constraints that have led and are leading to restructurings; tougher timetabling and ensuing time constraints; the sheer range of conflicting priorities; adapting to the new Common Inspection Framework and inspection arrangements and the closure of LSIS which has made a substantial contribution to the agenda in recent years. These considerations are set against the backdrop of high levels of youth unemployment and ongoing wider economic challenges. There is also cause for optimism in the untiring work, commitment and passion of teaching staff, and in opportunities in the new 16-19 study programme, in the innovation code, in social enterprise as part of the enterprise focus, and in the possibilities that Community Learning Trusts may offer in the areas of local and global sustainable living and working.

Given these challenges it is not surprising that the questions ‘why should we do this?’ or ‘why should I be interested?’ have been raised on a number of occasions, by both lecturers and senior management. The answer, albeit simple, is complex at the same time. Simple because there is plenty of evidence of the many converging socio-environmental and economic crises, the magnitude of the challenge and the urgency and determination with which humanity will have to act; complex because obvious solutions do not abound and the work in this area during the last few decades has demonstrated that information alone is not enough to spur people into action. Where information comes from is also an issue. The information comes from academics and scientists in many different fields, the social sciences, humanities and natural sciences; it also comes from many in grassroots organisations. But there is not a lead taken by government, funding bodies and Ofsted and those are the agents that the sector listens to the most.

'At its core, sustainability is a call for a change from our current trajectory, or in other words, a call to action (Barr, 2003). Sustainability cannot be achieved by simply relying on state intervention, legislation or new technologies; it requires that people actively participate in decision making, problem solving and sustainable change." (Frisk & Larson, 2011)

Change, although more difficult and slower, is possible without the funding and policy levers, if like-minded individuals and organisations put their heads together with a goal in mind. If it can be done in the name of enterprise, like the work of the Gazelle Group, then it can be done in the name of sustainability. The work of Wroxham Primary School, documented in Creating Learning without Limits, is also inspirational. The head teacher decided to focus on what matters, their learners and learning, rather than on Ofsted, and she and her whole team of staff have achieved 'outstanding' grades twice consecutively after having been a school under special measures. And maybe we need to listen to Emeritus Professor Frank Coffield from The Institute of Education who told an audience of managers and lecturers at a recent FE conference that the sector prides itself on its responsiveness, but that "you are too responsive, I think it is high time you stood up and started making minimal requirements of government." In an interview with him a few days prior he had elaborated: "Isn't there a time when tutors in FE say there are some things that are so important, and I keep saying: choose to fight on an educational issue. Sustainability would be a wonderful issue to fight on. Staff would be doing this for future generations, not for themselves, not to put more money in their own back pockets but for future generations and for the future of society. That is a great issue to fight on. Why don't we insist that sustainability is in the curriculum for all our students? It is not the government's curriculum, it's the national curriculum, it's our curriculum." (Coffield, interview March 2013).

Finally, it has been a real challenge, in writing this report, to balance the need of presenting as full a picture on the subject as possible while at the same time making it useful to a variety of readers, including teaching staff, who showed great interest in the emerging findings when they attended workshops.

"Education for sustainable development (ESD) is far more than teaching knowledge and principles related to sustainability. ESD, in its broadest sense, is education for social transformation with the goal of creating more sustainable societies. ESD touches every aspect of education including planning, policy development, programme implementation, finance, curricula, teaching, learning, assessment, administration. ESD aims to provide a coherent interaction between education, public awareness, and training with a view to creating a more sustainable future." (UNESCO, 2012, p.12)

2 Research methodology

2.1 Overview

LSIS commissioned Andrea Gewessler from Change that Matters Ltd, and Kirsti Norris from Action for Sustainability Ltd to undertake the research. The project was conducted over nine weeks, from 25th January to 5th April 2013. The report focuses on the learning and skills sector in England.

2.2 Aim of research

The aims of the research were outlined as follows:

1. To explore and further understand the relationship and relevance of sustainability and sustainable development to education and training in the FE sector;
2. To identify the specific skills and knowledge that teaching staff require to effectively embed sustainability in teaching, learning and the curriculum;
3. To identify barriers and challenges to embedding sustainability in teaching, learning and the curriculum;
4. To identify key ingredients, opportunities and strategies to address these barriers and challenges within the specified subject areas, curriculum levels and delivery contexts;
5. To consider how the outcomes from this specific research could be applied across the full spectrum of teaching, learning and curriculum;
6. To analyse strengths and gaps in the range of practice and resources available to teaching staff across different subject areas;
7. To draw together and present conclusions, suggestions and recommendations for how strategic bodies and stakeholders can support the sector in this area, and how providers themselves can respond.

2.3 Research methodology

Fundamental principles of the research have been to be open to all responses and to be open to complexity. By its nature, being open to complexity resulted in a wide range of data to analyse. The authors were keen that the research was an opportunity to hear the real thoughts of the sector on the issue. Such openness would allow more different thoughts and ideas to emerge than by using more traditional methods of data gathering.

We used a variety of research methods as outlined below. The online survey captured vast quantities of data from the whole sector, and the workshops continued this data collection and allowed for greater exploration of issues that arose. The methods we used were:

- Desktop research
- Online survey (in association with the Institute for Learning)

- Workshops, focus groups and explorations with learning provider staff (teachers, trainers, tutors, managers and sustainability practitioners)
- Interviews with key thought leaders in the field, learning provider staff, teacher educators, and stakeholder organisations.

Desktop research

Ongoing throughout the research, this initially informed what was included in the survey questions. For example, sustainability skills, and pedagogies listed in the survey were obtained from a literature review. Desktop research focused on policy; general education literature; literature on education for sustainability; environmental, social, and economics literature; sector case studies and resources available; and information on stakeholder websites. A list of literature, articles and websites used is included in the bibliography.

Online survey

The online survey was managed by the Institute for Learning on behalf of the researchers. It was open for responses for 2 weeks (27th February to 13th March 2013). The survey was completed by 500 respondents. Questions were designed to very closely reflect the research aims. Full responses are in Appendix 1.

Face to face group sessions

Workshops, focus groups and exploratory sessions were opportunities to seek thoughtful, considered responses from teachers, trainers and educators primarily, and in some cases also included managers and sustainability practitioners.

Workshops

Four-hour workshops, of between 6 - 12 participants were designed to be a two-way process of gaining research data, but also giving participants a deeper understanding of sustainability and an experiential learning of activities to use in their own teaching of sustainability. The workshops used a variety of means to work with participants, including creative activities; visioning, sharing best practice; looking at values and beliefs; searching what skills and knowledge tutors required; looking at barriers and solutions to embedding sustainability; and finding out what further support or training would help tutors.

Focus groups

Two-hour focus groups of between 5-8 participants were designed as a more time-efficient means of gathering qualitative research data.

Exploratory sessions

Two-hour exploratory sessions, with groups of between 5-9 participants, using dynamic facilitation, a reflective form of facilitation that allows a group to explore issues open-mindedly, address practical problems, and reach joint conclusions.

The workshops, focus groups and exploratory sessions will be referred to as “workshops” throughout the report. The different approaches were used to give opportunity for different

thoughts and ideas to emerge. Offering the range of sessions, covering different time frames also gave greater flexibility to learning providers with limited time available.

A call for learning providers to get involved resulted in 33 learning providers offering to host workshops, focus groups or exploratory sessions.

The following were run:

- Six workshops
- Three focus groups
- Two exploratory sessions (one provider had both a workshop and an exploration)

These were spread across the sector as follows:

- Six Further Education Colleges (including one specialist)
- Three Adult Community Learning providers
- One Work Based Learning provider

In total, 83 participants took part in the face to face group sessions.

Interviews

Interviews were conducted by phone or Skype.

Key thought leaders:

- Professor Bill Rees
- Professor Frank Coffield, Institute of Education
- Professor Joshua Farley, University of Vermont
- Dr Horst Rhode, Universitat Lubeck
- Dr Marie Eaton
- David Selby, Sustainability Frontiers
- Dr Kate Raworth, Oxfam
- Professor Stephen Sterling, University of Plymouth
- Professor William Scott, University of Bath
- Martin Kalunga-Banda MA, University of Cambridge Sustainability Leadership Programme
- Dr Denise Summers, University of Plymouth
- Dr John Blewitt, Aston University
- Professor Stephen Martin, Visiting Professor at the Open University Centre for Complexity and Change and Consultant on Sustainable Development and Education

Sector stakeholders:

- Iain Patton, EAUC
- Jane Ward, NIACE
- Ian Munro, AoC
- Bryan Davies, Ofsted
- Ann Finlayson, SEEd
- Rachel Cooke, Institute for Learning
- Graham Petersen, South Thames College and UCU

- Vicky Hutchinson, Lancashire Global Education Centre

2.4 A note on language and terminology used in the report

FE sector	Used in the report to include FE Colleges, Adult Community Learning, Work-Based-Learning, Offender Learning, Specialist Colleges and Sixth Form Colleges
Colleges	Used in this report when referring to all learning organisations in the sector.
Teachers	Where "teachers" are mentioned, this also refers to trainers and tutors.
Pedagogy	Used to describe the approaches to educating adults and well as children, rather than distinguishing between pedagogy and andragogy.
Workshops	The workshops, focus groups and exploratory sessions will be referred to as "workshops" throughout the report.
Sustainability	Throughout the report, the term "sustainability" is used, along with "embedding sustainability". Where other terms are used (e.g. sustainable development, education for sustainable development (ESD), etc) it is because it is part of a quote, or project title being referenced.

3 What is sustainability?

3.1 Introduction

This chapter seeks to explore what is understood by the term sustainability. Definitions and definition tools will be examined and contrasted with the current sustainability understanding in the sector, which emerges both from the survey and workshops.

3.2 Collated evidence

3.2.1 Sustainability definitions

Bruntland report

No report on sustainability can be considered complete without reviewing and examining the definition coined by the World Commission on Environment and Development, headed by Gro Harlem Brundtland, in their report "Our Common Future" from 1987:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (World Commission on Environment and Development, 1987, p. 43)

Jim MacNeill, one of the lead authors of "Our Common Future", is quoted in Victor as having explained the emergence of this as the dominant definition like this: "…In 1987, we thought the concept was plain enough. We defined it in several ways – ethical, social, ecological … Only one definition grabbed the headlines, however, and stuck, unfortunately to the exclusion of all others. It's the one that features the need for intergenerational equity…"(Victor, 2008, p.19)

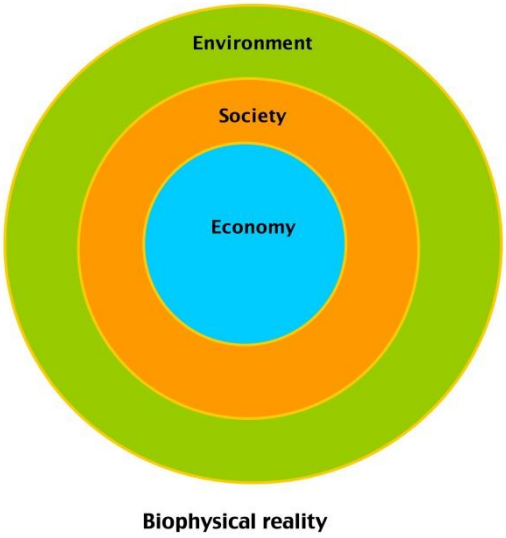
Victor himself says, "The absence of a completely unambiguous definition of sustainable development in the Brundtland report helped make it possible for governments, businesses, and others to adopt the goal of sustainable development without compromising their adherence to economic growth." (Victor, ibid)

Considering the report is now 26 years old and the number of important and urgent environmental, social and economic issues is growing – as is the scientific understanding of the biophysical reality – a more encompassing and more dynamic definition may be called for.

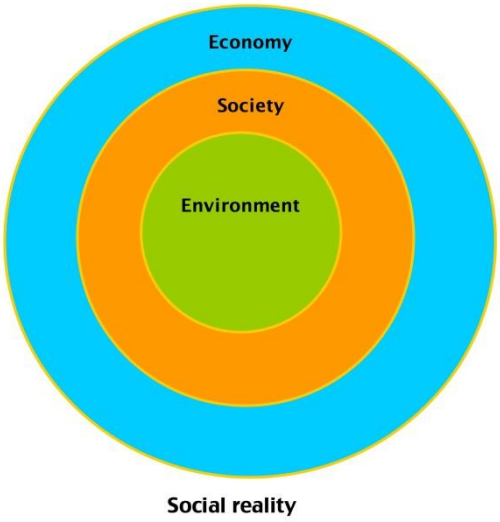
Nested model

An alternative to a definition is a tool such as the nested model. In a nested model of sustainability, social, economic and environmental systems are represented as concentric circles, with the largest representing the biggest and most important system, on which the other two systems are dependent. The textbook model usually represents the biophysical reality in which the environment as the largest system, and the economy the smallest. In the social reality, the economy is usually shown to be the largest and the environment the smallest. The three systems are also sometimes represented as pillars, and referred to as the

three pillars of sustainability, or in circles as a Venn diagram. Representation in the form of pillars or a Venn diagram makes the three systems appear equal, when they are not, so the nested model, whilst not representing reality's much more fluid boundaries and mutual interdependencies, is more effective at getting across the basic concept of sustainability. One way of defining sustainability is to describe it as the journey from the current social reality to the biophysical reality and this is how the term sustainability is used in this report.



Biophysical reality



Social reality

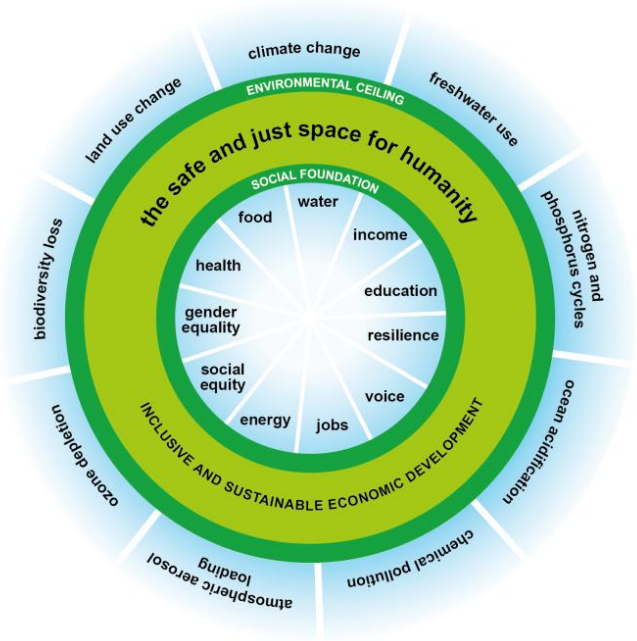
"Today, the concept of sustainability is seen in broader terms than … ecological sustainability, and includes community, organisational, cultural, economic, personal and social sustainability…these types of sustainability are not equal in importance because all human life and activity ultimately depend on the sustainability of the earth's systems." (Eaton et al, 2012, p.4)

Doughnut model

The Doughnut Model, developed in 2012 by Kate Raworth, chief researcher for Oxfam, in the run-up to Rio+20, builds on the concept of Planetary Boundaries developed by scientists at the Stockholm Resilience Centre in 2009. The scientists "identified and quantified a set of nine planetary boundaries within which humanity can continue to develop and thrive for generations to come. Crossing these boundaries could generate abrupt or irreversible environmental changes." (http://www.stockholmresilience.org/planetary-boundaries accessed 30 March 2013)

Three of the safe boundaries have, according to the scientists, already been crossed, namely climate change, biodiversity and nitrogen cycles. Raworth uses these planetary boundaries to set the environmental thresholds that need to be observed but adds a social foundation:

"Between a social foundation that protects against critical human deprivations, and an environmental ceiling that avoids critical natural thresholds, lies a safe and just space for humanity – shaped like a doughnut … This is the space where both human well-being and planetary well-being are assured, and their interdependence is respected." (Raworth, 2012, p.7)



In an interview she explains:

"I come from an economics background and I am very frustrated by the diagrams in economics which show the economy in the total absence of an environment; it is just free-floating, circular flow of economy…It tells you that the only thing you can do with that thing is make it go round faster, so you can make it grow – so embedded in the image that we study is the implicit assumption that growth is the objective. So this image gives us a different objective, it leaves the economy as a derived outcome and it puts in place the fundamental values that we care about – environmental integrity and human well-being. And then it is actually silent on what the economy should look like." (Interview Raworth, March 2013)

3.2.2. Further thoughts on sustainability

Apart from sustainability there are many other expressions of similar or related concepts in use, particularly in an educational context: sustainable development, sustainability education, education for sustainability (EfS), environmental education, eco-literacy, education for sustainable development (ESD) and more. Sometimes these terms are used interchangeably even though they carry with them different connotations.

Desktop research reveals the concern that when exploring the embedding of sustainability into education, a discussion on economic growth is often missing. This was expressed in a number of articles and books.

- Selby and Kagawa argue: "In schools and universities, the environmentalism that is most acceptable, often 'education for sustainable development' (ESD), embraces or stays mum about its stance on growth. Much ESD discourse has indeed been steeped in 'business as

usual' assumptions by implicitly and sometimes explicitly interpreting development as connoting sustained economic growth." (Selby & Kagawa, 2011, p.4)

They argue that by accepting or encouraging the concept of continued economic growth as being integral to ESD "… it becomes part of the disease rather than part of the cure. If we accept the finiteness of the planet – that the planet is not an inexhaustible cornucopia – and if we interpret 'sustainable development' as 'sustainable growth', then the 'sustainable development' label becomes oxymoronic, a contradiction in terms, …" (Selby & Kagawa, ibid)

- Discussions on sustainability need to address stance on growth and equity as well as on environmental indicators, to become meaningful. Environmental indicators, such as the planetary boundaries concept mentioned earlier, are becoming increasingly accepted. However, the question of growth is often considered controversial.
"To question growth is to oppose progress and those who do are immediately accused of wanting to take us back to the Stone Age, as if living in a mansion or caves were the only options." (Hamilton, 2010, p.34)
- Economists such as Peter Victor (2008) and Tim Jackson (2011) argue that the necessary absolute decoupling of economic growth from material consumption is not achievable, at least not in the time scale required, if ever, and that infinite growth dependent on material consumption is not possible on a finite planet.
- In an interview a college manager said: "It (economic growth) is not a debate we have here because we are not at that level. I don't think a lot of people in our organisation are thinking about this." (Interview 2013)

3.2.3 Sustainability understanding in the sector

The report is based on five ways of exploring the current sustainability understanding in the sector:

- In workshops, participants were asked to draw a picture of what they think sustainability is about. Participants were asked to look at each other's pictures and come up with key concepts that they noticed in each other's and finally in their own drawings.

"I thought the workshop would be a PowerPoint with the Bruntland definition, and facts and figures of why sustainability is important - I nearly didn't come."
Workshop participant

- In focus groups, participants were asked to define sustainability.
- In both workshops and focus groups, participants were exposed to the nested models in 3.2.1 above, which were used as a way of exploring sustainability understanding
- Stakeholder organisations were interviewed for their views on the sector understanding of sustainability, and finally

What are we trying to sustain? Are we trying to sustain the unsustainable in terms of lifestyle?
Workshop participant

- A set of questions was included in the survey

The key findings are as follows:

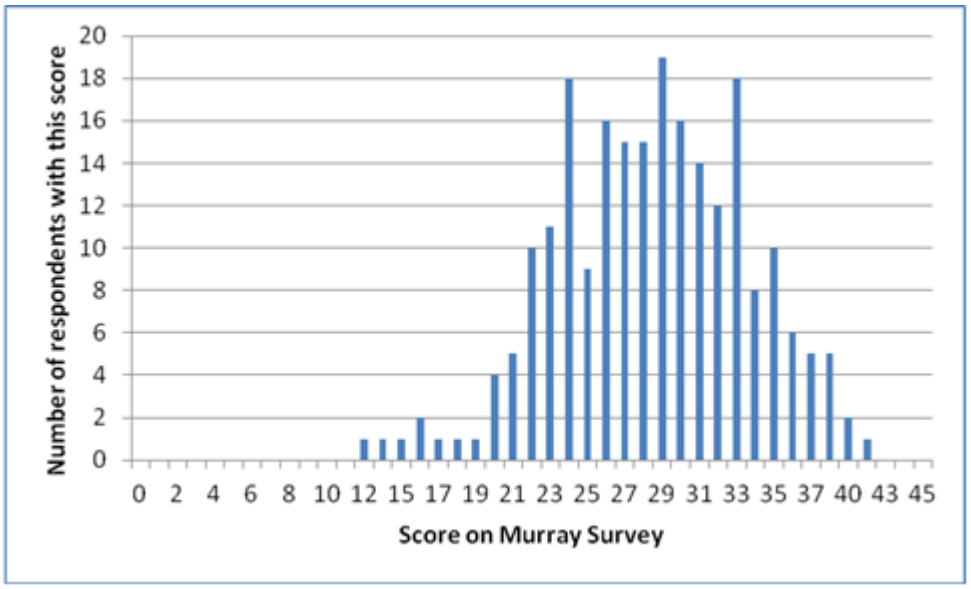
- Concepts that appeared most often when asked what sustainability means, particularly in the context of embedding it into teaching, learning and the curriculum:
    - Prudent resource use and recycling; making the best of the resources we have available; turning from paper to electronic devices; preventing running up against the buffers with regard to materials
    - Meeting the needs of today without compromising the needs of the future; planning for the future
    - Continuation, health, wellbeing, resources, solutions
- Other concepts appeared only once, the last three of which would not generally be associated with defining sustainability
    - Requiring a holistic view and that sustainability is not just about one thing but about thinking how it affects other things
    - Ability to develop a carbon neutral footprint

      Development, direction, cycle, long-term thinking, people, environment, balance, problems (e.g. global warming), interrelationships, natural world, awareness of attitude, harmony and balance with the planet, connection, action, self-motivating, support, making a difference, being aware, holistic goals, longevity, consequences of choices, long-term and short-term economics, respect for the natural world
    - For learners to retain the information they had been given
    - To be consistent in what the college is doing
    - Keeping on top of regulation
- Participants on the workshops repeatedly emphasised the need for understanding of what sustainability is as a pre-requisite to embedding it effectively into teaching, learning and the curriculum, and as the basis of any continuing professional development.
- Engaging with workshop participants in conversations and activities that required them to create their own meaning of sustainability stimulated a good level of discussion. Even where there was a mixed (and on occasions limited) understanding of sustainability, doing the activity on the nested model of sustainability pushed the thinking and conversation into a broader, deeper and more systemic understanding of the issues. Instead of giving participants complete models, they were merely given the concepts but were asked to build models of the social and biophysical reality themselves. All workshop groups concluded that in the biophysical reality the environment is the largest system, and the economy the smallest. In the social

"We are killing the outside circle because of the inner circle and the inner circle is not even benefiting everyone in the middle circle either." *Workshop participant*

reality, the conclusion was that the economy is the largest system, and the environment the smallest, although on two occasions individuals argued that the society is the bigger, followed by the economy. Identifying reasons why the current social reality has become unsustainable, and defining sustainability as a journey from the social reality version to the biophysical reality version, helped to clarify the meaning of sustainability.

"As voters, we have lost sight of any collective belief that society could be different. Instead of a better society, the only thing almost everyone strives for is to better their own position – as individuals – within the existing society. The contrast between the material success and social failure of many rich countries is an important signpost. It suggests that,



if we are to gain further improvements in the real quality of life, we need to shift attention from material standards and economic growth to ways of improving the psychological and social wellbeing of whole societies." (Wilkinson & Pickett, 2009, p.4)

- In order to gauge the sustainability understanding of survey respondents, the New Environmental Paradigm (NEP) measurement scale created by Dunlap and Van Liere (2000) and adapted by Murray (2011) was used. The NEP intends to measure a pro-ecological worldview using 15 questions to discover belief orientation and worldview. The highest possible score showing a complete belief towards sustainability is 45, and the minimum score is 0. A low score is 0-14 and a score between 15 and 22 is meant to represent ambiguous, conflicting and uncertain beliefs. (Murray, 2011, pp. 113)

409 people responded to this question out of 500 completing the survey. Only a small proportion of respondents had a low score or a score indicating ambiguous, conflicting or uncertain beliefs, leaving the vast majority displaying a certain orientation towards sustainability. The sector understanding, as it emerged from workshops as outlined above, looks different to the survey findings. This could be for one of two reasons:

1. The survey attracted mostly practitioners with a strong interest in sustainability. This argument is supported by the fact that the survey was lengthy and responses required a fair amount of thinking and reflection.

2. Response bias – "A response bias is a systematic tendency to respond to a range of questionnaire items on some other basis than the specific item content (…). For example, a respond might choose the option that is most extreme or most socially desirable." (Paulhus, 1991, p.17)

Given that there is a lot of consistency in the way questions have been answered throughout the survey, it is more likely that the variation is due to reason 1.

3.3 Conclusion

The current understanding of what sustainability means is by and large limited to resource and energy efficiency as well as recycling and to intergenerational thinking. Staff talk about recycling facilities, using recycled materials, not purchasing materials, switching off computers, avoiding paper use and moving towards electronic solutions or double-sided printing as well as leaving enough for future generations. This restricted view of what sustainability means, however, is not limited to the post-16 education sector but appears to be a prevalent, though insufficient, response.

"Most efforts by firms, individuals and governments in the name of sustainability are directed at symptoms of unsustainability rather than causes. These include policies to reduce waste, cut energy and material use, reduce GHG emissions, promote green products and local consumption, and so on. Many of these activities are necessary to create a more sustainable society and economy. But they are not sufficient. They fail to address the underlying sources of the unsustainable world we have created. I argue that the focus on symptoms and low-leverage policies reflects a widespread failure of systems thinking." (Sterman, 2012, p.23)

Engaging in conversations and activities that require people to create their own meaning of sustainability can be considered highly useful and more productive than issuing definitions. The definition used in this report is the journey from the social reality to the biophysical reality.

If definitions are being used, their historical context and the intention behind them need to be understood, and their stance on growth, social equity and absolute environmental limits needs to be transparent for them to become meaningful. Conversations need to reflect the high levels of interconnectedness and interdependencies amongst the various systems (environmental, social, cultural, and economic) in order to reflect the dynamic nature of sustainability. Sustainability requires a continuous redefining of our understanding. Central to this redefining process are conversations and dialogue as an act of creating meaning together.

4 What are the drivers for sustainability (in education)?

4.1 Introduction

This chapter looks at the current drivers for sustainability. There are many, but few are significant or are voiced strongly in the FE sector. Workshops, the survey and conversations with stakeholders repeatedly highlighted lack of policy, funding and inspection drivers. They also emphasised the many existing, and sometimes competing, agendas that FE and skills organisations have to attend to and comply with. Those that have implications in funding terms or may lead to a limiting grade in an Ofsted inspection are prioritised. In an interview with the former sustainability lead at Ofsted he explained, "Ofsted cannot inspect it if it is not a requirement. E&D was a requirement from the Learning and Skills Council. The LSC had a document stating that colleges had an obligation to do it so Ofsted could inspect it." (Davies, Interview March 2013)

A recent UNESCO report confirms the concerns of the sector as it states "There is no overarching UK Strategy for Sustainable Development which sets out a clear vision about the contribution learning can make to its sustainable development goals. This is needed." (UNESCO, 2013, pp.4 & 17)

Nevertheless there are strong messages conveyed in scientific and specialist reports, which give a very clear mandate to act with concerted and swift effort. Some of these messages are summarised at the end of this section.

4.2 The drivers

4.2.1 National

- The 2008 Climate Change Act commits to a binding 80 % cut of carbon emissions by 2050 against a 1990 baseline.
- The CRC Energy Efficiency Scheme is a mandatory scheme for large organisations to increase their energy efficiency and cut carbon emissions
- The Green Deal is a scheme for households and businesses to improve the energy efficiency of their buildings through government loans that are repaid, incurring a 7 % interest rate, from their existing energy bills.
- There is a range of government regulation with regards to energy and resource efficiency as well as carbon emissions, covering a range of industries and prominently engineering and construction. All new homes will have to be zero carbon from 2016.

4.2.2 International

- 2005 to 2014 is the UN Decade of Education for Sustainable Development. The four priority goals for the decade are to promote basic education, to reorient and revise educational programmes, to develop public understanding and awareness and to provide practical training.

4.2.3 Learner Voice

- Whilst more research may be needed in terms of post-16 learners and their attitudes towards sustainability, a 2012 survey by the National Union of Students (NUS) on behalf

of the Higher Education Academy showed that "over two thirds of 2011 first and second-year respondents (66.6 % and 70.3 % respectively), as in 2010 (70 %), believe that sustainability should be covered by their university; there is a continued preference among students for a reframing of curriculum content rather than additional content…" (Drayson et al., 2012, p.4)

4.2.4 Funding and tendering opportunities

- Increasingly, progress towards a recognised environmental management system (EMS) is a requirement for a growing number of funding and tendering opportunities. Recognised standards include
- ISO14001
- EMAS (Eco-Management and Audit Scheme) which is an EU system that adds several requirements to ISO 14001
- Global Reporting Initiative, which includes performance indicators such as energy, emissions and biodiversity.

4.2.5 League tables and awards

- People & Planet, the largest student campaigning network, issues an annual league table about ethical and environmental performance and measures institutions' progress towards becoming a Transition University, which is a university that is "low-carbon, low-energy, resilient, relocalised and community led" (http://peopleandplanet.org/goinggreener accessed 31 March 2013)
- The Green Gown Awards are annual sustainability awards for further and higher education across a number of categories that are awarded by the EAUC.

4.2.6 Business and Industry

- Increasingly, further education is being influenced by the requirements of business and industry.
- This can most noticeably be seen in Construction and the Built Environment where "sustainability has been developed quite extensively, and I think that reflects what's happening in the wider world and in the related professions. Education doesn't lead, it follows, and wherever a policy points towards or whichever way Business goes, then Education will seek to service and support them. That's clearly the case in both the HE and the FE sectors" (Blewitt, interview, February 2013)

4.2.7 Support programmes and resources

- Over recent years, the **Learning and Skills Improvement Service** (LSIS) has provided a wide range of services and resources under its "Leading and Learning for a Sustainable Future" programme, with the aim of supporting the sector on the sustainability journey including
  - Sustaining our Future – a strategic framework for sustainability

- Reaching Forward Index (RFI) a self-assessment tool for colleges to review current practice and performance in sustainable development, and identify areas of strength and areas for development
- Leading Sustainable Development – a facilitated programme to help senior teams envision a sustainability strategy and develop an action plan towards achieving it, and an online version for self-led development
- Leaders of the Future – a programme to equip sustainability champions with the skills to embed sustainability across their organisations
- Stepping up in Sustainability (SUS) programmes – funding colleges to run and disseminate projects that will enable them and others to take forward the sustainability agenda; case studies and resources from these programmes are available on the Excellence Gateway
- Regional Sustainability Advisers (RSAs) in each of the English regions to act as ambassadors for sustainability in further education and maintain and develop networks.

- The **Environmental Association for Universities and Colleges** (EAUC)
  - SORTED – the Sustainability Online Resource and Toolkit for Education is a website focused on the requirements of the FE and skills sector. It includes various weblinks, guidance documents and case studies.
  - Sustainability Exchange – a knowledge exchange platform for tertiary education including discussion forums. Built in 2012, this site is growing with resources including policy documents, reports, and presentations from conferences held in the sector.
  - Green Gown Awards – see League tables and awards above
  - An annual sustainability conference with representation from the university and college sectors
  - LiFE Index – an online performance management and improvement system
- The **Association of Colleges** (AoC) has recently established the AoC Sustainability Portfolio Group following on from a history of support for sustainability through the regional networks, particularly in the South West with the SW Sustainable Development Group of Colleges.
- **E-mandate** is a resource giving access to comparison data on organisations of a similar size with regard to energy efficiency, space efficiency and operating costs.
- There are other stakeholder and support organisations including the Lancashire Global Education Centre (LGEC), Sustainability and Environmental Education (SEED), The South West Learning for Sustainability Coalition, the Sustainable Development Alliance for Learning and Skills (SDALS) and the University and College Union. There will be other such organisations that have not been mentioned in this section.

4.2.8 Cultural and campaign drivers

There are a growing number of campaigns that support sustainability thinking at a grassroots level, these include:

- Transition Towns – a now international grassroots movement, which started off in Totnes, to address the twin challenges of climate change and peak oil
- One Planet Living – a global initiative based on 10 principles of sustainability
- 10:10 – carbon cutting campaign
- Love food, hate waste – campaign for reducing food waste
- Capital Growth – a campaign for 2,012 new food growing spaces

4.3 Messages from the science community and specialist reports

Professor John Sterman, director of the MIT System Dynamics Group at MIT Sloan School of Management, provides a summary of some of the big issues facing humanity, which provide a very clear mandate for determined action. In "Sustaining Sustainability: Creating a Systems Science in a Fragmented Academy and Polarized World" he says,

- "Humanity is overwhelmingly dependent on non-renewable resources, especially fossil fuels, and the resulting greenhouse gas (GHG) emissions are rapidly changing the climate." (IPCC 2007)
- Most of the world's fisheries are overexploited, and world capture fishery production is falling (FAO 2008).
- Extinction rates "exceed normal background rates by two to three orders of magnitude" with one- fifth of tracked species "classified as Threatened" (Hoffman et al. 2010).
- The food we eat, water we drink, and products we consume expose us to carcinogens and endocrine disruptors (e.g., US EPA http://www.epa.gov/iris).
- Humanity's total ecological footprint exceeds the global carrying capacity (Wackernagel et al. 2002).
- We have exceeded sustainable planetary boundaries for vital elements of the ecosystems upon which our lives depend, including GHGs, nitrogen, and biodiversity loss (Rockström et al. 2009).
- The demands we place on those ecosystems are growing: world population, which reached 7 billion in 2011, is projected to exceed 9.3 billion by 2050 and 10.1 billion by 2100 (United Nations 2011). Real Gross World Product (GWP) is growing at an average rate of 3.5 % y -1 (World Bank 2010)." (Sterman, 2012, p.22; bullet points added)

Every one of these points gives a mandate for change and for education to effect such change; together they make it a necessity. Generally, information from science gets translated into policy, which then gets reflected in education policy. Although there are drivers as can be seen above in 4.2, the science drivers in 4.3 are insufficiently strongly articulated in general, and education policy in particular, and this is perceived as a lack of mandate by the sector, as has been mentioned repeatedly in workshops.

4.4 How does the sector perceive its drivers?

The following questions about drivers were asked as part of the survey:

Question 6. How do you see your role post-16 education in promoting sustainability?

all FE	Extremely Important	Very Important	Not Important	Not at All Important	Not sure	Total
1) Reducing our carbon footprint and increasing resource efficiencies at an organisational level:	144(39.45%)	191(52.33%)	13(3.56%)	6(1.64%)	11(3.01%)	365
2) Giving learners the tools to make more conscious consumer choices in order to reduce their own carbon footprint:	150(41.1%)	185(50.68%)	17(4.66%)	4(1.1%)	9(2.47%)	365
3) Preparing students for green jobs and sustainable economic growth:	124(33.97%)	181(49.59%)	28(7.67%)	5(1.37%)	27(7.4%)	365
4) Equipping learners to challenge the current unsustainability at a systemic level and to work towards creating a sustainable society:	153(41.92%)	164(44.93%)	22(6.03%)	6(1.64%)	20(5.48%)	365

This question was particularly directed at how respondents view their own role in promoting sustainability. The four options received very similar responses from the 365 respondents. When combining the extremely important and very important categories, the lowest score, by a tiny margin, goes to 'Preparing students for green jobs and sustainable economic growth' and the highest one to 'Giving learners the tool to make more conscious consumer choices in order to reduce their own carbon footprint' as well as 'Reducing our carbon footprint and increasing resource efficiencies at an organisational level' which both gained 91.78 %.

Q7. For you personally, which of these statements would you most agree with? (364 responses)

all FE	Responses	Percent
I feel that embedding sustainability in my teaching and/or the curriculum is not part of my role.:	24	6.59%
I can see that embedding sustainability skills relevant to my subject area makes sense in terms of learners getting work in these areas in the future.:	90	24.73%
I see embedding sustainability as part of my wider educational role.:	216	59.34%
I am not sure if embedding sustainability is part of my role.:	22	6.04%
If other, please state:	12	3.3%

Again this question was directed at respondents. Only 6 % of the 364 respondents were unsure whether embedding sustainability is part of their role and an overwhelming majority, 59.34 % consider it to be part of their wider educational role. Further qualitative responses can be seen in Appendix 1.

Q8. What priority does sustainability have in your organisation? Please use the 0 to 5 scale with 0 being absolutely no importance to 5 highest possible importance. (364 responses)

all FE	Responses	Percent
0 - absolutely no priority:	34	9.34%
1:	44	12.09%
2:	65	17.86%
3:	118	32.42%
4:	59	16.21%
5 - highest possible priority:	44	12.09%

Q9. Are you aware of drivers for embedding sustainability within teaching, learning and the curriculum in your organisation? (364 responses)

all FE	Responses	Percent
Yes:	164	45.05%
No:	200	54.95%

Questions 8 and 9 move from personal views to perceived organisational drivers for embedding sustainability. Almost 55 % of the 364 respondents are not aware of drivers for embedding sustainability into teaching, learning and the curriculum in their own organisations. Sustainability is perceived to be given medium priority.

Q10. What are the key drivers in your organisation for embedding sustainability into teaching, learning and the curriculum? (Please rank from 1 to 6 with 1 being the most key driver and 6 being the least key driver.) If you do not feel that there are any key drivers in your organisation then you do not need to complete this question. (284 responses)

all FE	Ranking Averag
Ofsted expectation and grade:	3.09
Making efficiency savings:	2.94
New opportunities in the Green Skills agenda:	4.18
External expectations from funders, awarding bodies, local authority etc:	3.42
Learner expectations:	3.85
Integral to our ethos of being responsible and taking responsibility:	3.52

There is a question as to why only 284 out of a total of 500 survey respondents answered this question. Even though, in question 6 above, the preparation for Green Skills received the lowest score, in this question this was the highest ranked driver for embedding sustainability into learning, teaching and the curriculum, followed quite closely by other options. This is possibly due to the fact that question 10 was directed at the organisational level rather than at the individual respondent as was the case in question 6. The lowest ranking goes to making energy efficiency savings. This result does not match the experience when visiting organisations, where efficiency savings were generally high on the agenda. In interviews and workshop the lack of Ofsted expectations have been identified, whereas here Ofsted expectations and grade still ranks at 3 out of 6.

Q11. If you have any other key drivers within your organisation for embedding sustainability please can you outline them below.

54 people responded to this question. Full answers can be found in Appendix 1, and can be summarised as:

- achievement
- funding, cost, economic drivers

- meeting skills needs
- meeting (environmental) targets
- ethos, individual conscience, values
- partners' expectations
- resource use reduction
- strategy
- learners' personal and social development
- curriculum requirements.

Q12. Has your organisation encouraged you or your team to embed sustainability in your programme? (364 responses)

all FE	Responses	Percent
Yes:	131	35.99%
No:	179	49.18%
Not sure:	54	14.84%

Almost half of the 364 respondents to this question perceive that they have not been encouraged to embed sustainability in their programmes; just over a third have been.

Q13. How firmly do you feel sustainability is embedded in your organisation? Please rate the following: (364 responses)

	all FE					
	Yes consistently	Sometimes	Not often	Not at all	Not sure	Total
1) Does the behaviour of staff demonstrate their commitment to and understanding of sustainability?:	34(9.34%)	160(43.96%)	110(30.22%)	39(10.71%)	21(5.77%)	364
2) Does the behaviour of students demonstrate their commitment to and understanding of sustainability?:	12(3.3%)	134(36.81%)	142(39.01%)	56(15.38%)	20(5.49%)	364
3) Do staff talk about sustainability in meetings, at the photocopier, at the coffee machine, etc?:	37(10.16%)	86(23.63%)	114(31.32%)	104(28.57%)	23(6.32%)	364
4) Are decisions being made on the basis of sustainability impacts (economic, social and environmental)?:	39(10.71%)	124(34.07%)	77(21.15%)	70(19.23%)	54(14.84%)	364
5) Do staff talk about sustainability when they talk to learners and visitors about the college/organisation?:	37(10.16%)	121(33.24%)	85(23.35%)	71(19.51%)	50(13.74%)	364

Sustainability is not yet a consistent driver of staff or student behaviour or decision-making. The lowest score has been achieved by 'Do staff talk about sustainability in meetings, at the photocopier, at the coffee machine, etc?' Of the 364 respondents only just over 10 % think that this happens consistently, and almost 27 % scored it 'sometimes'. This may be an indication that sustainability has not as yet become part of FE's organisational culture.

4.5 Conclusion

There are some key national drivers such as the 80 % emission reduction target by 2050. There is plenty of evidence emerging from science that strongly indicates the necessity to act. However, this has not been translated into educational policy and is therefore not reflected in funding or inspection arrangements. Further, as indicated in the previous chapter on sustainability definitions, there are questions as to whether economic growth, a key objective of both the government and shadow government, can be decoupled from resource use and carbon emissions. It is therefore still unclear whether an emissions reduction target is enough, as the pursuit of energy efficiency alone, as highlighted by Sterman (2012), can be seen as a treatment of symptoms rather than root causes.

Many sector staff view embedding sustainability into teaching, learning and the curriculum as important. This can be deduced from both workshop conversations and survey results in this section, where slightly more than half of the respondents view it as part of their wider educational role to embed sustainability into teaching, learning and the curriculum. On the other hand, this commitment is hampered by competing agendas that take priority due to their impact on organisational survival, which is reflected in the survey results by only 45 % of respondents being aware of drivers in their organisation for embedding sustainability into teaching, learning and the curriculum.

Despite the lack of mandate, there is evidence that learners are asking for sustainability to be included in their curriculum areas, and teachers are keen to respond to this. Rachel Cooke from the Institute for Learning commented “If teachers and trainers are getting a sense from learners that they want to know about things like this then they are obviously going to take more time to put that in. Equally, lots of teachers and trainers are the ones driving it because they say it is the right thing. They believe it is what learners need to know for the future.” (Cooke, interview, March 2013)

5 Effective practice

5.1 Introduction

Effective practice is that which is deemed to be successful – but not necessarily flawless - and which others can learn from. It is drawn out as a means to showcase different examples of, in this instance, embedding sustainability in teaching, learning and the curriculum. Drawing out effective practice is to identify what is happening in the sector at the moment, and offer these as idea-generators for organisations wishing to embed sustainability. Effective practice should not be seen as benchmarks to aim for in the sector, but rather as a snapshot of where the sector is on its sustainability journey.

This section identifies effective practice taking place within the sector mapped out against sector subject areas. Current approaches to embedding sustainability are recognised, and it is discussed how transferable this practice is across the sector.

5.2 Collated evidence: current effective practice in the sector

5.2.1 Effective practice found during research workshops

Workshop participants were asked to list out where they already embed sustainability into their teaching, learning and curriculum areas. This exercise was revealing in that despite being focused on teaching, learning and the curriculum, participants at all workshops tended to stray into discussing operational issues, such as recycling, using Moodle, energy reduction, paper reduction, etc. in their organisations. This reflects the dependency of teaching and learning on buildings and other resources, but also suggests that understanding of embedding sustainability is still developing.

Nonetheless, there is evidence of embedding sustainability in teaching, learning and the curriculum, and examples drawn from the workshops are set out below. These have been grouped into subject sector areas. Examples from Adult and Community Learning have been listed separately:

Subject Sector Area	Project identified
Health, Public Services and Care	• **Military and Public Services:** Make and mend skills - military skills include make and mend, sewing, washing and correct care and maintenance of equipment. This tries to prevent a throw away mentality. Learners have regular kit checks and are fined if they lose or break equipment. Levels 2 and 3.
Science and Mathematics	• **Science:** Includes things about food waste and power generation.
Agriculture, Horticulture and Animal Care	• **Agriculture:** Dairy herd management - level 3 and foundation degree agricultural students discuss why the dairy herd is kept on a forage cased system, being less demanding on resources, and economically more efficient. • **Agriculture:** Discussions - ▪ Chicken imports: agricultural students discuss the environmental, economic and ethical issues around the pros and cons of buying chicken meat from Brazil rather than raising chickens close to consumption. ▪ Genetics: agricultural students discuss the value of genetic improvement to sustainable livestock production. • **Countryside management:** Linking environment with ecosystem services - pollution, habitat destruction, mainly at level 3. • **Animal Care and Equine:** Producing animal bedding - bedding is produced on site to cut costs, to reduce pollution and fuel consumption from transporting bedding, and for convenience. All levels of students and staff are involved. • **Animal and Equine Care:** Efficient horse / animal husbandry - correct disposal of waste; litter picking; muck heap management; skipping out for less waste. All levels of students and staff are involved.
Engineering and Manufacturing Technologies	• **Engineering:** Tractor performance - L3 engineers; land based training level 3. Tractor performance to achieve better performance from less fuel. • **Mechanics:** Metal recycling - All students in mechanics recycle scrap metal, and learn about the importance of recycling which includes watching a video of mining.

Construction, Planning and the Built Environment	• **Construction**: students talk about the sustainability of timber in contrast to concrete, and methods of construction and thermal efficiency. Regulation drives the syllabus, and the syllabus drives the delivery. • **Carpentry:** Wood used is FSC sourced. Students learn how to plan their cuts to use sheets of wood efficiently. • **Building services: –sustainability is** embedded because it is part of industry regulation e.g. particular boilers and heating systems.
Arts, Media and Publishing	• **Art:** art departments use recycled materials; material recycling is embedded in engineering and construction to reduce waste. Learners debate whether waste recycling is as good as or better than in industry. • **Art:** Reuse and recycling of art and craft materials - the intention is to save money and consider the environment and the sustainability of a responsible service. The target groups are 19+ learners at foundation level.
Preparation for Life and Work	• **Skills for life:** Volunteer programme - the intention is to be able to provide extra support for learners in class whilst at the same time provide skills for volunteers and enable them to gain a recognised qualification for free. Many of the volunteers progress into paid teaching positions and some of the students who have been helped by the volunteers progress into becoming volunteers themselves. It is a cyclical process that has proved self-sustaining. The volunteers help mostly on Skills for Life provision or on courses for learners with learning disabilities. Learners are 19+ • **Life skills:** Lessons about drugs, healthy living, smoking, exercise, healthy diets - the intention is to promote longevity and disease-free life progression. The target group is disengaged 16-18 year old learners at Entry 3 to Level 1.
Business, Administration and Law	• **Business studies:** Ethics and supply chain - Level 3 (year 2) students look at ethics issues in business such as Coca-Cola and Primark to raise awareness of the environment around the world, and of what goes into product production. Awareness is raised, but learners acknowledge that they are reluctant to change behaviour even with the raised awareness.

Generic provision	• **Employment services**: The intention of this free and openly available service is to help learners identify their skills, help them apply for jobs, support them with CV writing and put them in touch with employers. The target group are 19+ learners, the majority of which are unemployed.
ACL provision	• **Family Learning**: Healthy eating - the intention is to educate families about healthy eating and to help them get their 5-a-day, particularly as it has been identified as an issue by the local authority. It involves recipe sharing, and family fitness trough increasing activity levels. For 19+ learners plus children. The programme is very popular which is evidenced by increasing demand. • **Tap Dance**: no paperwork, all electronic referencing. The intention is to improve physical and emotional wellbeing through exercise. The learners are 16-90 on a Level 1 course (Foundation ACL). Success is seen in the delight of the students and an improved physique and wellbeing. • **Healthy eating:** spreading the word about healthy eating. The class learns to shop in a sustainable manner with awareness of personal wellbeing, food sources and environmental impact. The course is available to Level 1 learners (Foundation ACL) and the full age range 16-90. Success is seen in changed diet and shopping habits and eventually an improved lifestyle for future generations. • **Life coaching and creative courses:** for highly sensitive people. The intention is to enable people to use their potential and preserve their energy. The target group are adults in process of change and transformation, particularly women, black and minority ethnic groups and people with mental health needs. The impact is seen through really good feedback, referrals and progression onto FE. • **Your Voice – a programme about campaigning**: the intention is to introduce migrant communities to democracy and how their voice can be heard to influence change. The target group are 19+ adults from the local migrant community. Success is demonstrated by people accessing local services such as health education, participating in community forums, and progression in becoming learning champions as well as progression to FE and local ACL.

ACL provision (continued)	• **Taster courses of healthy eating in hard to reach communities**: the intention is to help develop community cohesion and encourage hard to reach learners back into learning through liaising with community development workers. The target group are adult learners from deprived communities at entry level. The success is demonstrated by the fact that a cooking club was formed, more classes have been requested; learners have progressed onto the Level 2 Hygiene Certificate, and learners have been asked to work in the community café – helping with lunches and fundraising. • **Community landshare:** a piece of land that is shared by the community, as is the resulting produce. The intention is to develop a wide range of skills including social skills, gardening and teamwork and to encourage sustainability. They develop community relations and learners share skills and knowledge. The target groups are 19+ learners at foundation level. • **Adult literature:** ▪ Poetry - literacy learning from Entry level 2 to Level 2 where learners wrote poems about a green issue during Green Week, which encouraged deeper thinking on these issues. Learners entered their poems into a cross-organisation competition. ▪ Learning verbs - over 19s Entry level 1 to 3 use text about endangered species when learning about verbs. ▪ Plastic bag discussion - literacy learners at entry level of mixed ages have a session on the impact of abandoned plastic carrier bags, to raise awareness of the issue in combination with practising literacy skills. • **IT:** Green typing - word processing practice using green ideas were made into bunting for Green Adult Learner Week. Learners were proud of their displayed work. Adults - all levels (entry to level 2). Also when practising word processing, environmental topics are used as the text to type out, so word processing is combined with learning about environmental issues. IT Entry level 3 to level 2.

In addition to the above, the following means of embedding sustainability were mentioned:

- Include environmental units as part of different courses.
- Offer students Level 1 Sustainability Skills as an additional qualification.

In all cases, embedding sustainability into teaching, learning and the curriculum was done outside of any organisational sustainability drivers, and was there because:

- It was already part of the course
- It was included because of a personal driver by the tutor involved

5.2.2 Effective practice seen in Stepping Up in Sustainability projects

LSIS has supported three rounds of Stepping Up in Sustainability projects - funded projects on a sustainability theme generating case studies and resources that other providers can access and utilise. Lists of these projects completed during 2010/11 and 2011/12 are included in Appendix 3 (including links to the case studies).

5.3 Analysis

5.3.1 Subject areas

Workshops were held at six FE Colleges, three ACL providers, and one WBL provider. Despite the high proportion of FE Colleges represented, a higher proportion of ACL courses have been identified as embedding sustainability. The flexibility of the funding stream allows ACL providers to have more autonomy on what is included in the curriculum of these courses, and they are therefore better able to respond to local community needs and requirements.

Subject areas that were either not represented at the workshops, or where examples were not given of how sustainability is embedded, include:

- Science and Mathematics
- Information, Communication and Technology
- Retail and commercial enterprise
- Leisure, Travel and Tourism
- History, Philosophy and Theology
- Social Sciences
- Languages, Literature and Culture
- Education and Training

This is not to say that sustainability is not being embedded in the subject areas, but:

- they were not represented at the workshops; or
- examples were not given at the workshops

Indeed, viewing the survey results in detail indicates that all subject areas do embed sustainability in some way.

As well as looking at the subject areas, the theme of the sustainability projects and embedding activity is of interest. In the first two years of the Stepping Up in Sustainability funded projects, a development can be seen from the first year focus on common themes such as energy, food and recycling; to the second year of a wider remit of inspiration, training, understanding skills, partnership work, and exploration. Whilst LSIS have set the funding criteria, information relayed at Stepping Up in Sustainability dissemination events for the

third year projects have shown that sustainability is now being seen as more than recycling and energy reduction. This development from operational sustainability to a widening of the understanding and interpretation of sustainability is a significant observation for the sector's sustainability journey.

5.3.2 Identifying approaches in use to embed sustainability into teaching, learning and the curriculum

From an analysis of the different ways that sustainability is embedded in the curriculum, described in the workshops and detailed in the Stepping Up in Sustainability case studies, eight main approaches to embedding sustainability have been identified. These can be summarised as follows:

Approach 1	Dropping in "sustainability" topics as and when possible, spotting every opportunity and making the most of this. This formed one part of the approach at Truro and Penwith College, identified in their LSIS Stepping Up in Sustainability project 2012/13 where opportunities are identified in the initial teacher training to incorporate sustainability, backed up through opportunities to deepen sustainability understanding being identified during lesson observations. Student teachers are encouraged to look for opportunities to ask critical questions of their learners, to question assumptions, and to bring other perspectives into discussions. Embedding sustainability in this way requires teaching staff to have an understanding of what sustainability is, to enable opportunities within curriculum to be identified. This requires training to ensure that the wide concepts of sustainability are understood, to be drawn on where appropriate.

Approach 2	A planned approach to include the topic in particular identified lessons. A sustainability specialist or champion (or an outside consultant, or organisation) may work with teaching staff to help develop lesson plans and resources for particular curriculum areas to use. This approach has been used in a couple of LSIS Stepping Up in Sustainability projects - e.g. Blackpool and the Fylde College 2012/13; Leicester College 2011/12. Extra staff time requirements to develop resources may be needed to adopt this approach. If using a sustainability specialist, or champion, then funding or organisational support is needed to implement this.

Approach 3	Teaching staff adopt different pedagogies, and by doing so, create a different way of working, learning, and enabling the learner to understand themselves and the world. This approach has been demonstrated by Walsall Adult and Community College, using their LSIS Stepping Up in Sustainability project 2012/13 to embed accelerated learning techniques into their English for Speakers of Other Languages (ESOL) provision. Using different pedagogies requires openness to experiment, support to do this, and a mandate to be creative. It can also require training for teaching staff in different ways of teaching.

Approach 4	In some subjects, elements of sustainability are already embedded in the curriculum as part of awarding body requirements. This can be seen in construction where learners are taught about using resources efficiently - for economic and environmental reasons; and in business studies where learners look at the ethics of business practice, for example in relation to child labour, or the environmental, social and ethical impacts of the production of Coca Cola. Whilst this may happen without added support, to take full advantage of the teaching opportunity, staff should have an understanding of what sustainability is, to enable opportunities within curriculum to be used well. This requires training to ensure that the wide concepts of sustainability are understood, to be drawn on where appropriate.

Approach 5	Some courses are focused on sustainability issues, particularly those that have been designed to respond to the call for increasing Green Skills provision necessitated by the Green Deal - e.g. installing insulation; etc. Although the course may focus on elements of sustainability, it may actually focus on particular areas of sustainability - such as energy reduction. Teaching staff may require training to ensure that the wider concepts of sustainability are also understood.

Approach 6	Students are offered an additional course to their main course of study, to gain a sustainability qualification through extra hours of study. This approach has been used by Totton College. This gives learners an additional qualification, but care should be taken to ensure that sustainability is not separated out from other aspects of learning. Awareness of how the learners' core subject area relates to sustainability issues is required too.

Approach 7	Sustainability is included in lessons without being recognised as "sustainability". Research has shown that when curriculum staff explore the meaning of sustainability, they can then identify elements of their teaching where sustainability is already embedded, without realising this was part of 'sustainability' before. In the research, it was seen that by discovering these natural occurrences can motivate them to then do more to embed sustainability within their teaching area (Osborne, 2012). Although this is mentioned as a separate Approach, this can also apply alongside other approaches mentioned above. Training, to understand the wide concepts of sustainability, can help teaching staff to understand how their teaching may already embed sustainability to some extent.

Approach 8	A well-cited approach to exposing learners to sustainability is through themed weeks such as Climate Change Week and Fairtrade Fortnight, organised by staff. These are important in terms of creating a culture within the institution that demonstrates that these are important issues to look at. However, they have varying levels of success in terms of engaging learners. Some teaching staff make use of these themes in their lessons or in tutorials. Generally these weeks are not successful at embedding sustainability within teaching, learning and the curriculum, unless they are organised by the learners themselves. Colchester Institute Learner Support Services organise themed weeks. To encourage these weeks to be included in lessons, resources are uploaded onto the VLE for tutors to include easily.

It would be valuable to understand which of the above approaches are of most value to the learner, in terms of developing their understanding of sustainability, acquiring sustainability competences and leading to increasingly sustainable behaviours and choices. Further research is required to understand this more fully.

In most workshops there was a discussion on whether sustainability should be a requirement on lesson plans. There was no consensus, as participants were concerned that teaching staff may reject it; or it may not be embedded properly. Others felt that at least it would be seen if it were on the lesson plan requirements, and be out there. During these discussions it became apparent that in two organisations there *is* a requirement to include "sustainability" within sessions, indicated to teaching staff with a box to tick on session plans. Most participants present at the workshop from these two organisations were unaware that this was even on the planning sheets.

5.3.3 Is effective practice transferable?

In identifying these pockets of effective practice in the sector, it is pertinent to consider how transferable they are. In an interview with Dr Horst Rhode, a sustainability specialist at

Leuphana Universität, Germany, he suggests that whilst it might seem straightforward, transfer is actually pretty impossible. Applying good practice in a different context is possible but still challenging - the needs and requirements of the situation are always different, with different students, organisations, financial situations and availability of competences, amongst other factors. Just taking someone else's resources does not work. He does suggest that good practice can be of value when it stimulates thinking and reflection on how it can be used in one's own practice (based on an interview in German with Horst Rhode, March 2013).

With this in mind, the challenge for sector organisations is to be aware of effective practice, understand how it has been approached, and reflect on whether that approach either:

a) could work in their own setting;

b) has the potential to inspire another idea that can be implemented.

5.4 Conclusion

Whilst there are many examples of effective practice in the sector, there is no common approach, and no common set of competences that are being offered to students. The progression from operational issues of recycling and energy efficiency towards a broader understanding of sustainability can be witnessed from the examples given. Just as every institution is on its own sustainability journey, so it seems is the sector. Before it can be understood what teaching staff need to support them to embed sustainability, an understanding of what it is that needs to be embedded is required. This will be looked at in Section 6.

6 Learning, teaching and the curriculum

6.1 Introduction

This chapter of the report is different from others in that it is largely informed by desktop research and interviews. The intention is to move the thinking on how to effectively embed sustainability into teaching, learning and the curriculum to a different stage. A large proportion of it is academic, in the sense of relating to reading rather than to practical work. This is for good reason. In chapter 3 it has become apparent that sustainability is a concept that is only partially understood by the sector, this includes things such as resource efficiency and energy saving. However, the wider meaning of sustainability, of how the journey of moving from the social reality to the biophysical reality can be enabled through educating young people and adults, is still widely ignored. This is also reflected in the sector's current effective practice in section 5.

"The message to students is often one of trimming our excesses or reigning in our wasteful practices through recycling and energy-saving light bulbs. While technology and innovation are necessary to shaping our common future, we also must recognise that addressing global sustainability issues such as climate change, world hunger, the spread of infectious diseases, gross inequalities among peoples, and degrading ocean ecosystems requires a deeper understanding and more systemic solutions." (Eaton et al., 2012, p.3)

The vast majority of thinking on this topic of embedding sustainability into teaching, learning and the curriculum is taking place in higher education as well as schools and so there is a lack of research that draws on experiences in further education, adult and community learning and work-based learning. Nevertheless much of the research does look applicable, even though it will require the expertise and input of subject specialists, who will be able to make sense of the findings within their subject and vocational specialisms.

This chapter leads through the following journey of thinking:

- Two key ways of looking at education for sustainable development or at embedding sustainability into teaching learning and the curriculum – A model proposed by Paul Vare and William Scott is explored in the context of asking questions such as a) Why sustainability is being embedded; b) How success of effective embedding is to be measured; c) What is considered the purpose of education; and linked to that d) How effective learning gets defined.
- The competences and thematic areas which are associated with the effective embedding of sustainability into teaching and learning. This touches on the question of whether knowledge can lead to new behaviours, in this case increasingly sustainable ones.
- The types of pedagogies that may work particularly well in synergy with sustainability education.
- The way all of the above can happen so it leads to real transformation rather than tweaking of existing ways of working.

- A brief look at green skills and a few ideas on what other curriculum areas might be needed.
- Before the conclusion is drawn, a few general observations are made and the overarching principle of interdisciplinary working is emphasised.

6.2 Two key ways of looking at education for sustainable development or at embedding sustainability into teaching learning and the curriculum

Professor Stephen Gough and Professor William Scott (2003) have identified three types of approaches to sustainability, learning and change:

"**Type 1** approaches assume that the problems humanity faces are essentially environmental, can be understood through science and resolved by appropriate environmental and/or social actions and technologies. It is assumed that learning leads to change once facts have been established and people are told what they are.

Type 2 approaches assume that our fundamental problems are social and/or political, and that these problems produce environmental symptoms. Such fundamental problems can be understood by means of anything from social-scientific analysis to an appeal to indigenous knowledge.

Type 3 approaches assume that what is (and can) be known in the present is not adequate; desired 'end-states' cannot be specified. This means that any learning must be open-ended. Type 3 approaches are essential if the uncertainties and complexities inherent in how we live now are to lead to reflective social learning about how we might live in the future."

(Vare & Scott, 2007, p.3)

Paul Vare and William Scott have developed a way of thinking about Education for Sustainable Development (ESD) based on these three types of approaches. They distinguish between ESD 1 or 'learning for sustainable development' and ESD 2 or 'learning as sustainable development'. ESD 1 is considered the type of education that promotes "behaviours and ways of thinking, where the need for this is clearly identified and agreed" whereas ESD 2 is about "Building capacity to think critically about [and beyond] what experts say and test sustainable development ideas, exploring the contradictions inherent in sustainable living" (Vare and Scott, 2007, p.3)

Rather than mutually exclusive, they consider ESD 1 and ESD 2 to be complementary. They suggest that ESD 1 is mapped to Type 1 and 2 approaches, whereas ESD 2 is mapped to Type 3.

ESD 1 usually comes from an external source and may be incentivised.

"This would be about engaging learners in behaviour changes that have been agreed by experts and solutions that have been externally generated. These include education about recycling, switching off lights, increased use of public transport, reducing food waste and the like. Many different voluntary and public sector organisations are involved in bringing about this change through awareness raising events, promotional literature and campaigns.

Information is often given in bite-sized junks, without having to think about the bigger, global context. This approach is exemplified by stickers on walls that say switch off the lights before you leave the room, putting in place recycling facilities and green travel plans, running food growing projects, installing insulation, changing light bulbs as well as integrating some ideas on how the particular subject can be "greened" through the use of recycled resources or the use of fewer chemicals." (Gewessler, 2011, FE News http://www.fenews.co.uk/fe-news/sustainability-through-learning-and-teaching accessed 4 April 2013)

ESD 2 usually comes from within. "Learners are now not taught specific sustainable practices but instead are given the meta skills to challenge and question, so empowering them to make sound choices." (Gewessler, ibid)

Workshop conversations and reading of the sustainability literature reveal that much of the sustainability work in colleges focuses on ESD 1 alone. ESD1 is not bad but merely an insufficient response on its own.

It could be argued that whether ESD 1 is promoted as an almost inclusive response or as a combined approach with ESD 2 may depends on several underpinning factors including:

a) Why sustainability is being embedded;

b) How success of effective embedding is to be measured;

c) What is considered the purpose of education; and linked to that

d) How effective learning gets defined

a) So for instance, going back to the nested model explained in chapter 3, if one wants to embed sustainability into teaching, learning and the curriculum, pursuing sustainability within the 'social reality' model, the effective embedding would look significantly different than if embedding sustainability into teaching, learning and the curriculum is meant to enable the journey from the 'social reality' to the 'biophysical reality' model in chapter 3. In the former example ESD 1 may be sufficient, in the latter ESD 2 needs to be a crucial component.

b) There is also the question of how the success of effective embedding of sustainability into teaching, learning and the curriculum is to be measured. If success is to be measured in terms of lessons including sustainability as a theme, that is observable and can be translated into SMART learning outcomes that are documented in lesson plans, then this is significantly different from intending to measure the success in terms of real-life outcomes. Such real-life outcomes may be that civilisation has successfully mitigated climate change, has developed resilience to climate change effects and has made a successful transition to society that puts planet before profit. The former is what education is used to and is a fairly straightforward change process: the steps that need to be taken are logical and easy-wins are readily identified and ESD 1 might be sufficient. The latter, however, would require ESD 2 alongside ESD 1. The added challenge would be that the outcomes of education would cease to be predictable for many decades to come. They would be neither measurable nor testable.

"One of my employments is for an education provider within a HMP. We are required to embed aspects of sustainability into our sessions to increase learners' awareness of ecological

and personal sustainability. This is expected by Ofsted and the organisation but only as a box-ticking exercise. ….” (Survey respondent)

c) All of this is strongly linked to the question of the actual purpose of education. If the purpose is seen in the preparation of young people so that they can become employable, then the goal of successfully navigating a path from the ‘social reality’ to the ‘biophysical reality’ may indeed be perceived as a threat.

“We are so focused on the qualifications and we forget everything else. That says a lot more about our social thinking and thinking about education and how that has become very narrow and focussed. So we are no longer educators in the broad sense, we are qualification givers.” (Workshop participant)

“Education is at odds with sustainability when modern economies function to damage and destroy the ecological systems that support human and non-human communities. The explicit mission of contemporary school reform is to prepare students to perpetuate these problematic economies (Gruenewald, 2003).” (Sipos et al., 2008, pp.69)

If on the other hand education is seen in a liberal education sense that refers to “… a philosophy of education that empowers individuals with broad knowledge and transferable skills, and that cultivates social responsibility and a strong sense of ethics and values” (Humphreys, 2006, p.3), then that journey might be welcome. ESD 1 would be more logical to the former and ESD 2 an integral part of the latter.

In order to ascertain whether the current system is adequate to equip students to effectively navigate the many converging crises, which Coffield and Williamson call the ”main threats to our collective wellbeing”, and which in their view include issues such as “global warming and climate change; rising and corrosive social, economic and cultural inequalities and the intensification of competition and struggle for scarce resources such as water”, they advise that institutions self-assess themselves against 5 key questions:

1) “Does the education we offer enable citizens to meet the future threats to our way of life?
2) Do our educational, social and work organisations enable learners to experience democratic ways of working? Are they engaged in the social and political life of their communities?
3) Do they encourage the dialogue and public reasoning that leads to new knowledge and social change?
4) Do our practices respect the human rights of all those we work with?
5) Do all citizens leave our schools, colleges and universities as lifelong learners who understand how to learn and who can assess their own weaknesses, strengths and enthusiasms as learners?” (Coffield and Williamson, 2011, pp.30-31)

d) The question of how effective learning gets defined is closely linked with how the purpose of education is perceived. It is likely that a focus on passing exams is easily met by a transmissive pedagogy, Freire’s banking model, whereas a liberal education model is likely to

be linked with a transformational pedagogy. It is of course not impossible to pursue transformational pedagogy in a banking model but it is also not very likely. For ESD 2 a banking model could not possibly work as thinking is required that is collaborative, systemic and critical.

6.3 What do we embed when we embed sustainability into teaching, learning and the curriculum?

A key question is what it actually means to embed sustainability into teaching, learning and the curriculum. Whatever the responses to the four questions in 6.2, it still leaves the questions of what students need to know, what they need to be able to do and what attitudes they need to acquire, unanswered. One approach that is gaining momentum in sustainability education is that of competences. This includes generic and key competences as well as competences associated with certain thematic areas.

Wiek et al. (2011) "… differentiate competences from key competences, the latter being critically important for sustainability efforts, distinguishing them from those of other professions and academic programs. This distinction does not imply that ''regular'' competences, such as critical thinking and basic communication skills, are not important for sustainability professions and academic programs (they are!). Rather, it emphasises the competences considered essential for sustainability that have not been the focus of traditional education and therefore require special attention." (Wiek et al., 2011)

As part of this research, the survey included several questions on skills and knowledge, having avoided the term competences which is sometimes used synonymously with skills. Generic competences such as critical thinking, reflective thinking and communication skills will be explained in appendix 4, if they were part of the survey, otherwise the focus for this report will be on key competences and competences associated with a range of thematic areas.

It is important to note that inclusion of these competences in learning and teaching does not automatically imply a journey towards sustainability. Indeed these competences can also be used to contribute to further unsustainability (Wals & Corcoran, 2012).

6.3.1 Key competences

There are many models available that identify key sustainability competences. The table that follows highlights and compares some current thinking on key competences. Further exploration of other competence frameworks can be found in Wiek, Withycombe & Redman (2011) who have completed an extensive listing of different competence models.

Frisk & Larson, 2011	Wiek, Withycombe & Redman 2011	Wals & Corcoran 2012	de Haan 2006 Gestaltungskompetenz*
Systems thinking and an understanding of interconnectedness	Systems thinking competence (see Appendix 4)	Systems thinking	
Long-term, foresighted thinking	Anticipatory competence	Anticipatory thinking	Think in a forward-looking manner, to deal with uncertainty, and with predictions, expectations and plans for the future
Stakeholder engagement and group collaboration	Interpersonal competence Incl. advanced skills in: communicating, deliberating and negotiating, collaborating, leadership, pluralistic and transcultural thinking and empathy		Participatory competence
Action-orientation and change-agent skills	Strategic competence (wider than Frisk & Larson)		Planning and implementation competence
	Normative competence**		
	Empathy included in interpersonal competence above	Emphatic understanding and open-mindedness	Ability to feel empathy, sympathy and solidarity
		Coping with uncertainty	Included in above: Thinking in a forward looking manner
		Utilising diversity towards creativity	
			Work in an interdisciplinary manner
			Reflect in a distanced manner on individual and cultural concepts
	Transcultural included in interpersonal competence above		Competence to achieve open-minded perception, transcultural understanding and cooperation
			Motivate oneself and others

* “Gestaltungskompetenz can be described as the forward-looking ability ‘to modify and model the future of the societies in which you live, participating actively in the spirit of sustainable development’. (Michelsen & Adomssent, 2007, p.22)

**”This capacity enables, first to collectively assess the (un-)sustainability of current and/or future states of social-ecological systems and, second, to collectively create and craft sustainability visions for these systems. This capacity is based on acquiring normative knowledge including concepts of justice, equity, social-ecological integrity, and ethics (e.g., to know which practices can be transformed or discarded and which must be maintained to sustain viability of life-supporting systems);…” (Wiek et al., 2011)

From the detailed research by Wiek et al. on key competences, and also from the table above which has been compiled for this report, it is apparent that there are many more overlaps than uncertainties about what the key competences are that students need to develop in order to create an understanding of sustainability and to act sustainably. Of course, some of the models use different language such as foresighted and anticipatory competences but they essentially contain very similar skills, knowledge and attitude components. Others, on the other hand, such as Wiek et al.’s interpersonal competence are much wider than, say, Frisk and Larson’s stakeholder engagement and group collaboration. Further analysis, outside the scope of this project, would be needed to ascertain the exact overlaps and omissions contained in the various competences mentioned. However, there is sufficient overlap to get a clear indication as to what types of competences are considered key for developing sustainability understanding and action. The following list has been derived from an analysis of the table above

Key competences

1. Systems thinking
2. Long-term, foresighted and anticipatory
3. Stakeholder, group collaboration and wider interpersonal competence
4. Action-oriented and change agent competence
5. Empathy, sympathy and solidarity
6. Coping with uncertainty
7. Normative competence

6.3.2 Competences in thematic areas linked to sustainability

In addition to the key competences, students need to develop competences in a number of thematic areas which are central to sustainability.

One model based on thematic areas was presented to the 2012 Teacher Education for Equity and Sustainability Conference by Professor Arjen Wals. The distinction between a broad and narrow way of viewing each of these thematic areas is important. Many of the ‘broad’ ways of understanding these different thematic areas also overlaps with key competences and they would certainly be considered to require an ESD 2 approach.

Thematic areas	Narrow	Broad
Environmental education	1. Local environment 2. Traditional biological and geographical emphasis 3. Implicit of Western perspective on the environment 4. Developing caring interest in environment and practising study/research skills (Teaching about the environment)	5. Local/national/global environmental interdependencies 6. Exploring relationship between human behaviour and global eco-systems 7. Exploration of non-Western perspectives on the environment 8. Developing concerned awareness, action competence etc. (teaching for the environment)
Consumer education	1. Limited carrying capacity of the earth 2. Impact of lifestyles on buying decisions 3. Making smart economic choices 4. Considering waste reduction	1. Reflection on values present in society and how they shape ourselves 2. Reflection on personal responsibility and accountability 3. Considering environment, economy, ecology and ethics
Human rights education	1. Teaching based on key international documents 2. Emphasis on civil and political rights 3. Implicit acceptance of Western view of rights 4. Teaching about rights (history of rights, case studies, etc.)	1. New rights, e.g. Earth Rights as expressed in the Earth Charter 2. Social and economic rights given equal emphasis 3. Exploration also of non-Western perspectives 4. Teaching for rights (i.e. developing skills) and in rights (i.e. democratic open classroom climate)
Climate change education	1. Causes and effects of climate change 2. Human impact on climate change 3. Impact of lifestyle choices on climate change 4. Understanding carbon footprints	1. Dealing with complexity and opposing views 2. Making conscious choices with regard to own behaviour 3. Considering different perspectives on climate Change that Matters Ltd Impact of climate change on other people and other species
Disaster risk reduction education	1. Learning to identify and assess risks 2. Disaster preparedness and response 3. Risk minimisation	1. Building a community of safety and resilience 2. Being able to deal with uncertainty 3. Developing and comparing future scenarios 4. Vulnerability, equity and empowerment

Thematic areas	Narrow	Broad
Development education	1. Problems of 'Third World' countries (teaching about development) 2. Implicit acceptance of Western view of development 3. Solutions are aid-based 4. Student involvement: charitable collections	1. World development/interdependences 2. Non-Western perspectives given due emphasis 3. Solutions lie in reforming economic/political arrangements within and between societies 4. Student involvement: developing skills for participation in decision-making processes (teaching for development)

Table contents originally represented in a flower model by Wals

Other thematic areas that may be worth considering are

- Power and participative democracy
- Community resilience (e.g. emphasis on the work of the Transition Town movement)
- Self and interconnectedness competence

6.3.3 From knowledge and competences to action

Whether knowledge and competences need to be developed which are considered generic or key or whether they are related to a range of thematic areas, the question emerges whether the focus on knowledge and competences in teaching, learning and the curriculum is enough to enable learners to think and act sustainably. Frisk & Larson (2011) are particularly concerned with the application of knowledge and for knowledge to make a difference it also needs to lead to action.

"The failure of environmental education to broadly change individual behaviours and collective action is primarily unsubstantiated assumptions about the relationships between knowledge and behaviour (Finger, 2010; Simmons & Volk, 2002; McKenzie-Mohr, 2000; Ramsey, 1993)." (Frisk & Larson, 2011)

They therefore emphasise the need to integrate different types of knowledge (Kaiser & Fuhrer, 2003) in the development of competences and supporting pedagogies. These types of knowledge are

- Declarative knowledge
- Procedural
- Effectiveness
- Social

"Before someone can act, he or she must know how things should be, and what can be done. While the first form of knowledge is composed of declarative environmental knowledge, the second consists of procedural (i.e. action-related) knowledge. The third form of knowledge, effectiveness knowledge, is particularly relevant when behaviour is instrumental in optimising a person's cost–benefit ratio. Besides declarative knowledge, procedural knowledge, and effectiveness knowledge, social knowledge also influences ecological behaviour. It is, on the one hand, helpful to know what others do and what they refrain from, in order to avoid being exploited by others. On the other hand, it is also important for a person to be aware of his or her own and others' expectations, if one wishes to avoid feeling guilty or when one wants to avoid social sanctions." (Kaiser & Fuhrer, 2003, p.600)

Here are some examples of what these different knowledge types might look like:

Knowledge type	Examples & explanations
Declarative knowledge	Workings of an ecosystem; effects of carbon emissions on climate; knowledge about how solar panels work; how the election system works; where food comes from
Procedural knowledge	How to recycle; how to avoid waste; how to save energy; how to get politically involved in the local community
Effectiveness knowledge	Knowledge of the ratio between personal cost, such as effort or financial investment, and ecological or social benefit
Social knowledge	Motives and intentions of other people gleaned through observation of their behaviour; conventional (seeking approval/fearing of losing approval) and moral (those coming from the person themselves based on their idea of the rights of others, fairness and justice) social norms

Based on Kaiser & Fuhrer, 2003

Kaiser and Fuhrer (2003) claim that all four different types of knowledge need to converge to ensure ecological behaviour.

6.4 Learning and pedagogy

"Education either functions as an instrument which is used to facilitate integration of the younger generation into the logic of the present system and bring about conformity or it becomes the practice of freedom, the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world."

Paulo Freire, Pedagogy of the Oppressed

The term pedagogy, which is usually related to the art and science of educating children, is used in this report without taking account of the debates about how it differs from or resembles andragogy, which usually relates to the education of adults. No explicit consideration is given to the newer concept of heutagogy, which refers to self-determined learning. Analysing the exact meanings and assumptions underpinning these different concepts goes well beyond the remit and capacity of this report.

The report focuses on the types of pedagogy that are seen particularly relevant for embedding sustainability into teaching, learning and the curriculum. This does not imply that they are not equally suitable for the learning and teaching of other competences or that there are no other pedagogies which would also be suitable in a sustainability education context. Indeed experimentation will be essential if new types of pedagogies are to be developed.

Key questions that need to be asked are 'what type of learning does the sustainability agenda require?' and 'what type of learning can prepare young people and adults to effectively work with the complexities and uncertainties that they encounter and enables them to work towards a future that is sustainable?' As Ann Finlayson commented "we have to challenge people on their pre-conceptions about how learning happens, what education is for, and how their practice matches their values" (Finlayson, interview, February 2013).

Consideration will be given to transformational learning, active and participatory learning and pedagogies associated with these. The boundaries amongst these different types of learning are fluid.

6.4.1 Pedagogies particularly suitable for embedding sustainability into teaching, learning and the curriculum

Here are some indicators as to what makes (sustainability) education effective:

"…Tilbury, 2011 identified four key processes underpinning ESD:

- processes which stimulate innovation within curricula as well as through teaching and learning experiences;
- processes of active and participatory learning;
- processes which engage the 'whole system', and
- processes of collaboration and dialogue (including multi-stakeholder, and intercultural dialogue)." (UNESCO, 2012, p.25; bullet points added)

This is supported by:

"Active and participatory learning have been broadly agreed as core processes underpinning ESD by a number of researchers and commentators worldwide and across educational settings. They are commonly recognised as central to teaching and learning strategies for sustainable development because they encourage learners to:

- ask critical reflective questions;
- clarify values;
- envision more positive futures;
- think systemically;
- respond through applied learning;
- explore the dialectic between tradition and innovation."

(UNESCO, 2011, p.29 in WWF, 2012, p.17)

"Segals et al. (2010) argue that collaboration will result in better products and processes for

student learning. In a study done to compare different pedagogical approaches, they found that more community-focused, group-oriented activities resulted in higher cognitive learning and more dynamic interactions than individual approaches." (Frisk & Larson, 2011)

The 2012 UNESCO report highlights nine types of learning that have emerged from the global monitoring and evaluation survey and that are particularly associated with sustainability education. Transmissive and disciplinary learning would be considered traditional approaches whereas systems-thinking based learning and multi-stakeholder based learning as emerging pedagogies. As mentioned above the emphasis in sustainability education is on non-transmissive and interdisciplinary learning.

Learning	
Discovery learning	Learners are immersed in a rich context where they encounter some element of mystery; they become curious and begin to make sense of their experience through their own exploration.
Transmissive learning	Using didactic skills (e.g. presenting, lecturing, story-telling) and supporting materials (e.g. workbooks, instruction forms, visuals) a body of knowledge, set of rules or code of conduct is transferred to the learners.
Participatory/ collaborative learning	Although not identical, both emphasise working together with others and active, not passive, participation in the learning process, which tends to focus on resolving a joint issue or task.
Problem-based learning	Focused on solving real or simulated problems, to better understand the issue or find ways to make real-life improvements. Issues are either identified by the learners, or pre-determined (e.g. by teachers, experts, commissioning bodies).
Disciplinary learning	Taking questions of a disciplinary nature (e.g., geographical and biological) as a starting point, to better understand underlying principles and expand the knowledge base of that discipline.
Interdisciplinary learning	Taking issues or problems as a starting point, then exploring them from different disciplinary angles to arrive at an integrative perspective on possible solutions or improvement
Multi-stakeholder social learning	Bringing together people with different backgrounds, values, perspectives, knowledge and experience, from both inside and outside the group initiating the learning process, to set out on a creative quest to solve problems that have no ready-made solutions

Critical thinking-based learning	Exposing the assumptions and values people, organisations and communities live by and challenging their merit from a normative point of view (e.g. animal well-being, eco-centrism, human dignity, sustainability) to encourage reflection, debate and rethinking.
Systems thinking-based learning	Looking for connections, relationships and interdependencies to see the whole system and recognise it as more than the sum of its parts; and to understand an intervention in one part affects other parts and the entire system.

(UNESCO, 2012, pp.25)

It is important to recognise that there are frequently synergies with what is being learnt, i.e. competences, and pedagogies.

In research carried out by Frisk & Larson (2011), they identified a number of pedagogies and activities which are useful in the context of acquiring certain key competences.

Key competences (Frisk & Larson, 2011)	**Associated pedagogies**
Systems thinking and an understanding of interconnectedness	Real-world explorations; place-based learning; problem-based learning
Long-term, foresighted thinking	Visioning activities; forecasting; backcasting; scenarios;
Stakeholder engagement and group collaboration	Group-projects; presentations; role-play activities; community-service learning
Action-orientation and change-agent skills	Project-based learning; place-based projects;

6.5 Transformative learning

If inclusion of certain key competences does not necessarily lead to sustainability (Wals & Corcoran, 2011), it may be safe to assume that the same applies to pedagogies, i.e. inclusion and use of certain pedagogies does not automatically lead to sustainability. So how can learning become transformative?

Research into sustainability education also leads to the concept of transformative learning (Sterling, 2011; Sipos et al., 2008; Parker & Wilding, 2012; Selby & Kagawa, 2012; PCE 2004). The authors take different stances on the concept but there are some concepts that are addressed by many:

- Sterling (2011) considers the work of Mezirow, the originator of the idea in adult education practice, and also the work of Bateson's three orders of learning and change. First order learning, according to Bateson, is about learning without looking at or challenging the assumptions and values that underpin it; second order learning is a deeper level of change, in which values, assumptions and beliefs are not only examined and questioned but also

changed if this is considered necessary by the learner. Bateson has a third learning level, which leads to "…the experience of seeing our worldview rather than seeing with our worldview so that we can be more open to and draw upon other views and possibilities." (Sterling, 2011, p.23)

- "The case for paradigm is that learning within paradigm does not change the paradigm, whereas learning that facilitates a fundamental recognition of paradigm, whereas learning that facilitates a fundamental recognition and enables paradigmatic reconstruction is by definition transformative." (Sterling, ibid)
- So the transformation of worldview is dependent not only on (a) challenging beliefs, values and assumptions within our worldview but also on (b) recognising worldviews and questioning the assumptions, beliefs and values that underpin them, and, through that critical reflection, in dialogue with others, on (c) being able to begin imagining alternative futures and how to respond to the issues one encounters.
- Transformative learning is learning that embraces what Bloom terms the cognitive domain linked to the affective and psychomotor domain, emphasising the importance of integrating head, heart and hands. According to Parker & Wilding (2012) there is a fourth domain, which they label social ethical domain, and which they view "…as an emergent property arising out of the integration and interaction of the other three domains." (Parker & Wilding, 2012, p.15)
- Both Sterling (2011) and Parker & Wilding (2012) mention that learning has both an inner and outer dimension. Parker and Wilding give a range of useful examples of what these inner and outer dimensions look like in terms of learning outcomes and activities under the heading of the four domains. Activity examples of the inner domain include:
    - Cognitive: mindfulness/awareness meditation; silence and solitude
    - Affective/Emotional: deep listening exercises; reflection; wilderness solo retreat
    - Psychomotor/Physical: focusing exercises; yoga, tai chi
    - Social ethical: council practice, mindful dialogue exercises
- Sipos et al. (2011) have identified a set of pedagogies that they have found most useful in terms of bringing about transformational learning and thus bringing together these different domains of learning including: action learning, community-service learning, critical emancipatory pedagogy, environmental education and problem-based learning. (Sipos et al, 2011, p.74) The focus is therefore on learning that leads to action that is often place-based and serves the local community. "There is no transformation without action. On the other hand, if action is emphasised exclusively, to the detriment of reflection, the word is converted into activism." (Freire, 1996, pp.68) The whole institutional approach to sustainability that is described in the leadership section of this report also focuses on community in addition to curriculum. This action-based community-service learning is one reason why adult and community learning that engages with the community in dialogue has potential to be particularly well-placed to bring about transformational learning.
- Eaton et al. (2012) and Selby & Kagawa (2012) stress the importance of emotions of grief and despair as an essential part of what in this report is referred to as embedding sustainability into teaching, learning and the curriculum. "Truly transformational learning,

we submit, involves conscious, deep and sustained processes of engaging with pain, despair and grief over what we are losing, moving towards acceptance while searching for radically new meaning and values, and equipping ourselves for personal and collective empowerment and action;…" (Selby & Kagawa, 2012, p.6). Eaton et al. (2012) focus particularly on what they refer to as the pedagogies of reflection and contemplation and what they can contribute to transformative learning.

- An important observation is made in the New Zealand learning and education for sustainability report "See Change". It is highlighted that transformational learning needs to happen at both the individual as well as the systems level. "This will require a redesign of many systems that currently exist in societies. As a result, education for sustainability is often perceived as highly political." (PCE, 2004, p.48)

6.6 Other curriculum matters

6.6.1 Green Skills and what are the other skills needs of the future?

This report does not focus on Green Skills as LSIS has commissioned a separate report on this area of work. Green Skills will be important in reducing carbon reduction and resource efficiency.

Green skills have been identified in the Green Skills in London report. According to the International Labour Organisation there are three ways in which the move to a low carbon economy affects green skills: a) green restructuring away from high emitting industries which will result in job losses in those industries; b) upskilling of professions who due to environmental requirements on their profession need new or at least different skills or knowledge; and c) new occupations are created as there is demand for entirely different skills. The report predicts high growth sectors in alternative fuels, wind, geothermal, building technologies and medium growth in solar, biomass, waste management and recycling. (GLE, n.d. p.10) There is an apparent shortage of people qualified to Level 2 and 3 and a likelihood of an excess of higher education graduates with low carbon skills. Furthermore, a shortage of people with STEM qualifications has been identified.

An important question FE needs to ask is: To what extent does the current Green Skills agenda represent a shift in thinking (i.e. towards the biophysical worldview) or to what extent is it part of a business as usual thinking, with a move towards becoming more sustainable but within the key driver of stimulating economic growth?

"Driven by mostly economic interests and technological innovations, companies are beginning to re-orient themselves to what is commonly referred to as the 'green economy' and its related 'green skills' and 'green jobs'. The demand for a workforce capable of working in such an economy is clearly on the rise. Vocational schools are responding by reorienting their curricula. From an ESD perspective, it is important to follow this promising trend critically, to make sure the P for People and the P for Planet receive at least as much attention as the P for Prosperity. The social pillar of sustainability needs to be added to the TVET curriculum so that workplaces are equitable." (UNESCO, 2012, p.48)

TVET = Technical and Vocational Education and Training

In an interview with ecological economist Professor Joshua Farley he states that STEM education is important but that at least equal importance needs to be given to the humanities, the social sciences and philosophy:

"I'm not one of these people who says that it's all science, technology, engineering and mathematics. I'm actually a big believer that we have a lot of science, what we have is a lack of direction about what our goals should be as a society. There is a famous baseball player in the United States who said a lot of funny things and one thing he said while he was driving is "We might be lost but we're making great time!" And this is the way I feel we are as an economy. We're making great time towards the completely wrong set of goals and those goals are ever increasing material consumption with very little evidence that it makes us better off…. the way I look at it is science, technology, engineering and maths are all about how to make better time, but it's a lot of the humanities and philosophy and the social sciences that focus on where we should be going and, as I say, since I think we are lost, making better time is not our primary goal. Figuring out where to go is our primary goal."

"I don't preach this idea that moving towards a sustainable future leads to misery and sacrifice, to shivering in the dark. I'm actually a huge believer, especially as an American, that our excessive consumption has made our lives much worse, that we're now taking huge amounts of anti-depressants and drugs and we're driving our cars everywhere, we've become hugely obese and diabetic, which are horrible consequences of our current levels of over consumption and lack of exercise resulting from our dependence on fossil fuels." (Joshua Farley, interview March 2013)

6.6.2 Additional thoughts on embedding sustainability into teaching, learning and the curriculum

- Interdisciplinary and multidisciplinary learning have huge potential for learning in a way that relates to the highly complex world that students live in and the types of messy problems that they will have to deal with in their lives. Climate change issues will not be able to be overcome without input from many different disciplines ranging from climate scientists to those working in agriculture, psychology, transport, education, town planning, construction or social justice fields. This way of learning poses major organisational and structural challenges for educational institutions – timetabling, staff contracts and student tracking are just the tip of the iceberg.
- The role of the tutor or lecturer will need to be reflected upon. If issues such as climate change or biodiversity loss are too complex to be thoroughly understood by one person and therefore multiple perspectives are needed to work with this full systems complexity, then the tutor can no longer remain the sage on the stage. Tutors need to be specialists in learning and reflection and the learning capacity needs to be improved. Tutors will be co-learners, facilitators and educators; after all to educate means to draw out and not to put in.
- In an interview with Marie Eaton, Professor of Humanities and Education at Fairhaven, she mentioned three approaches with her students that stand out as particularly insightful and practical:

- Given the complexity of the issues that student will need to tackle in their lifetimes she makes it an explicit objective for students to be able to ask better questions about complex issues by the end of a course.
- To support this, she also exposes students to complex problems in her classes. "We often present students with fairly tidy problems that have solvable answers in order for them to demonstrate a skill but this is not the way these problems show up." (Eaton, interview February 2013)
- In order to prepare students effectively she presents them with different arguments about a problem. "I really want them to learn to negotiate the rhetoric that is used to promote pro-growth for example, and to do this in a way that's not demeaning of people who hold that position but act with genuine curiosity, about how someone presented with the same data that I see could come to such a different conclusion." (Eaton, interview February 2013)

- As there is a move to different ways of learning, towards, participative, collaborative, multi-stakeholder, individual, place-based etc. there remains a question whether the current learning spaces are suited for these types of learning? Do learning spaces need to be rethought? Many institutions will not have the funding to think about new buildings or even refurbishing old ones but there is plenty that can be done even with no or little money. Re-arranging tables and chairs or replacing tables with chairs and placing them in a circle, although simple, may have profound effect. How would these changes shift power dynamics, relationships and ways of relating? What would teaching sessions be like if classrooms were like the iSpace at the University of St Mark and St John (pictured)?

6.7 Conclusion - So how do I make use of these findings as a tutor in FE?

This has been a question throughout the report: how can this report be made meaningful? The question that emerges is about how the practice of embedding sustainability in teaching, learning and the curriculum can be moved along, beyond Vare & Scott's ESD1 concept, beyond recycling and resource efficiency, while at the same time remaining useful for practitioners on the ground? How can learning in FE become transformative? How can the practice that is going on at the moment be seen as stepping stones towards the social, cultural and economic transformation that is required? This section in particular could be considered the beginning of such research in FE.

Throughout the workshop sessions another question kept returning and that was about identifying some key objectives for embedding sustainability, almost like the Every Child Matters outcomes. There is a temptation to give a recipe for embedding sustainability into teaching, learning and the curriculum in response to this request by teaching staff. This recipe would, however, not take account of the complexity of the issues, of the sector and of the organisations in which they are to be implemented. The assumption that cause and effect can be identified only works in simple systems, not in complex ones. Hence giving a recipe that claims that certain ingredients will lead to students becoming citizens who are able to navigate the complexities and ambiguities that they will encounter in their lives and that will enable them to create a sustainable and equitable future would be close to delusions of grandeur.

This section offers some vital ingredients but how they are mixed together, the intentions behind putting them together, the quality of ingredients and so forth will be a matter of reflection and learning. Importantly, very similar ingredients can lead to very different results. The same principle applies here. It is therefore essential to be clear about what the big goal of embedding sustainability into teaching, learning and the curriculum is. What's the future that we, as a society, would like to cook up?

To summarise, some of the ingredients that may be part of embedding sustainability into teaching, learning and the curriculum effectively are:

- Development of key competences such as systems thinking and anticipatory thinking
- Development of generic competences such as critical thinking, creative problem solving and communication skills
- Development of competences associated with thematic areas such as climate change, disaster-risk reduction, consumerism and democracy and power
- Knowledge components that need to address four different knowledge types
- Knowledge alone is not enough though. For learning to be transformative, learners need to see worldviews rather than see with a worldview; they need to have holistic

"Sustainability would be your topic and you would embed all your skills in this. This would be the theme of all your delivery. You wouldn't slot this (sustainability) into your delivery." *Workshop participant*

experiences which encompass the cognitive, emotional (affective) and physical (psychomotor) domain and which lead to ethical decision making.

- Learners need to be able to experience grief, anger and fear in face what might be lost but also the ability to co-create desirable visions of a future that keep humanity within safe planetary boundaries and allow humans to flourish while ensuring equity.
- Tutors will need to reflect on their roles as teachers in a complex system.
- Better use needs to be made of learning spaces to work in harmony with a range of pedagogies.
- Pedagogies need to work in harmony with competences and thematic areas. Focus is on reflective, action-oriented, community-service, collaborative, participative, interdisciplinary and place-based learning.

Whilst a move towards effectively embedding sustainability into teaching, learning and the curriculum is eminently doable, it will require a major change effort. There is sometimes a notion that all education is positive and that may well be the case in terms of personal development but as David Orr so eloquently says, "My point is simply that education is no guarantee of decency, prudence, or wisdom. More of the same kind of education will only compound our problems. This is not an argument for ignorance, but rather a statement that the worth of education must now be measured against the standards of decency and human survival -the issues now looming so large before us in the decade of the 1990s and beyond. It is not education that will save us, but education of a certain kind" (Orr, 1991, p.1).

7 CPD, support and teacher training

7.1 Introduction

One output specified for this research was to recommend how the skills and knowledge required by teaching staff can be effectively developed and promulgated, for example through initial teacher training (ITT) and continuous professional development (CPD).

Through workshops with teaching staff, and interviews with sector stakeholders, it has been widely acknowledged that to embed sustainability requires further development of teacher skills and knowledge.

Before it can be understood what support and professional development teaching staff require, it is important to understand the competences they need. This section is therefore presented in two parts:

- Looking at teacher competences - what do teaching staff need to know?
- Focus on CPD for teaching staff - how to acquire the competences.

7.2 Part One - teacher competences

7.2.1 Introduction

The survey, workshops, and desktop research were used to understand what teacher competences are required to effectively embed sustainability in teaching.

7.2.2 Collated evidence

7.2.2.1 Survey findings

In the survey, respondents were asked to select the three specific skills or knowledge they believe teaching staff require to effectively embed sustainability in teaching, learning and the curriculum. The most frequent responses are as follows:

- A greater understanding and knowledge of sustainability
- Confidence
- Communications skills
- Commitment to sustainability
- Creative thinking
- Critical thinking
- How to apply sustainability to different subject areas.

(a full list of responses is included in Appendix 1)

7.2.2.2 Workshop findings

When asked what further support they would like to help embed sustainability, teaching staff at workshops identified a number of skills and knowledge areas that they would welcome further training in:

- Understanding sustainability further
  - Relevant to subject area
  - Relevant to possible job opportunities for students
  - Simplicity of message
  - Key concepts knowledge / what do key terms mean
  - Clarity of definitions
  - How to make it relevant
- Confidence building - it's OK not to know all the answers
- Awareness and motivation training
- Self-awareness training
- Environmental awareness training
- ICT skills - particularly Moodle: how to upload; how to access
- How to open minds - how to encourage people to think wider
- Reviewing the pedagogies that we use

7.2.2.3 Desktop research

WWF have produced a "Professional Development Framework of Teacher Competences for Learning for Sustainability" (2012). This framework is based on a review of existing frameworks. The WWF framework divides teacher professional development into four groupings for "Learning for Sustainability" (LfS):

1. Values of the LfS View of Education
2. Personal and Professional Attitudes
3. Skills for Professional Practice
4. Core Knowledge and Understanding

(WWF, 2012, p.13)

It is worth looking at these in turn, as will be done below, as they provide a comprehensive list and help clarify the different areas of professional development required for embedding sustainability and the implications for CPD to help teaching staff achieve these.

1. Values of the LfS View of Education

"Teachers of LfS will hold a view of education which:

- recognises that each individual is on their own learning journey and they progress at different rates;
- adopts a co-learning approach with students, while offering guidance and showing leadership;
- recognises that teaching is not value-neutral and the learning context and the learning process should reflect the values being taught;
- promotes critical thinking and questioning;
- perceives education as a transformative process, expanding the individual's worldview;
- sees reflection as a key part of teaching and learning;
- sees knowledge as continually emerging and liable to change;
- requires teachers to question themselves in terms of their practice and take opportunities to conduct research into their own teaching;
- has a balance between disciplines and interdisciplinarity where the reductionist focus on individual subject is seen in the context of the systemic whole;
- values and promotes learning outside the classroom."

(WWF, 2012, p.15)

2. Personal and professional attitudes

"Teachers of LfS, through their professional practice, will show a commitment to:

- equality and justice, including the rights of future generations;
- valuing biodiversity and the natural systems which support life;
- respecting social and cultural diversity;
- dialogue and collaboration with colleagues, especially in relation to bridging subject barriers;
- challenging assumptions, including the assumptions underlying unsustainable practice;
- being open minded;
- reviewing and developing their own practice through reflection and by being prepared to risk experimenting with new approaches to learning;
- promoting systems thinking as a means to understanding the interdependent nature of the world;
- respecting the voice of learners in discussion and democratic decision-making."

(WWF, 2012, p.16)

3. Skills for professional practice

“Teachers will be able to:

- adopt a connected (systemic) view of the world;
- engage and empathise with learners and build positive relationships;
- select appropriate teaching methods that reflect the knowledge skills and attitudes inherent in LfS;
- devise and facilitate learning that encourages systems thinking; creative thinking and critical thinking;
- promote a balance between independent learning and collaborative learning with peers;
- create opportunities for learning to be transformative in terms of challenging assumptions and expanding worldviews;
- encourage meaningful participation in debate and decision making;
- reveal the links between rights and responsibilities, and between actions and consequences;
- help learners develop strategies for coping with issues which are open-ended, complex or uncertain;
- help learners to recognise alternative perspectives on controversial issues and on issues which may cause an emotional response;
- help learners envision alternative futures and practice action-planning;
- create opportunities to reflect on learning;
- devise assessments which are formative and developmental, and which address attitudes as well as knowledge and skills;
- connect learners to their dependence on the natural world;
- connect learners to a sense of local and global community;
- reflect and make connections between theory and practice;
- use research to develop own practice;
- work collaboratively with colleagues to facilitate interdisciplinary learning and to develop LfS;
- advocate and provide leadership for sustainability where appropriate.”

(WWF, 2012, p.17)

4. Core knowledge and understanding

"Key concepts:

- the interdependence in natural and human systems;
- consumption and environmental limits;
- equity, justice and cultural diversity;
- biodiversity;
- power and democracy;
- the linear and the cyclical economies;
- climate change;
- uncertainty, risk and precaution;
- change for sustainability"

(WWF, 2012, p.19)

7.2.2.4 Analysis and summary

When asked to identify what skills and knowledge they themselves require to embed sustainability, by far the most common response is for a greater understanding of what sustainability actually is. Confidence (whilst not a skill or knowledge) is also commonly cited, as is the need to understand more about sustainability's relevance to the subject area. Both of these come from the anxiety of not knowing enough about sustainability to teach it to learners.

Other skills, knowledge, attitudes and values were listed by survey respondents and workshop participants. The WWF "Professional Development Framework of Teacher Competences for Learning for Sustainability" (2012) offers a framework to work to.

7.3 Part Two - CPD for teaching staff

7.3.1 Introduction

The research sought to identify if teaching staff wanted CPD opportunities to assist the embedding of sustainability into their teaching areas - and if so, what format would be most useful.

7.3.2 Collated evidence

7.3.2.1 Desktop research: Institute for Learning Green Economy Survey March 2011

The Institute for Learning conducted a Green Economy Survey of members in March 2011, completed by over 3,000 teachers. This survey showed a strong interest from teachers for more CPD in sustainability, and that CPD opportunities enable exchanges of good practice, especially within subject areas between teachers and trainers. Members felt that CPD opportunities should be subject specific, with some that are more generic.

7.3.2.2 Survey

The survey conducted as part of this research aimed to build on the responses gained from the IfL March 2011 survey.

How many respondents have received training on embedding sustainability?

In the survey, we asked: Have you received training with regard to embedding sustainability into teaching, learning and the curriculum?

Yes	69 respondents	(23 %)
No	220 respondents	(73 %)
Not sure	12 respondents	(4 %)
Total	301 respondents	

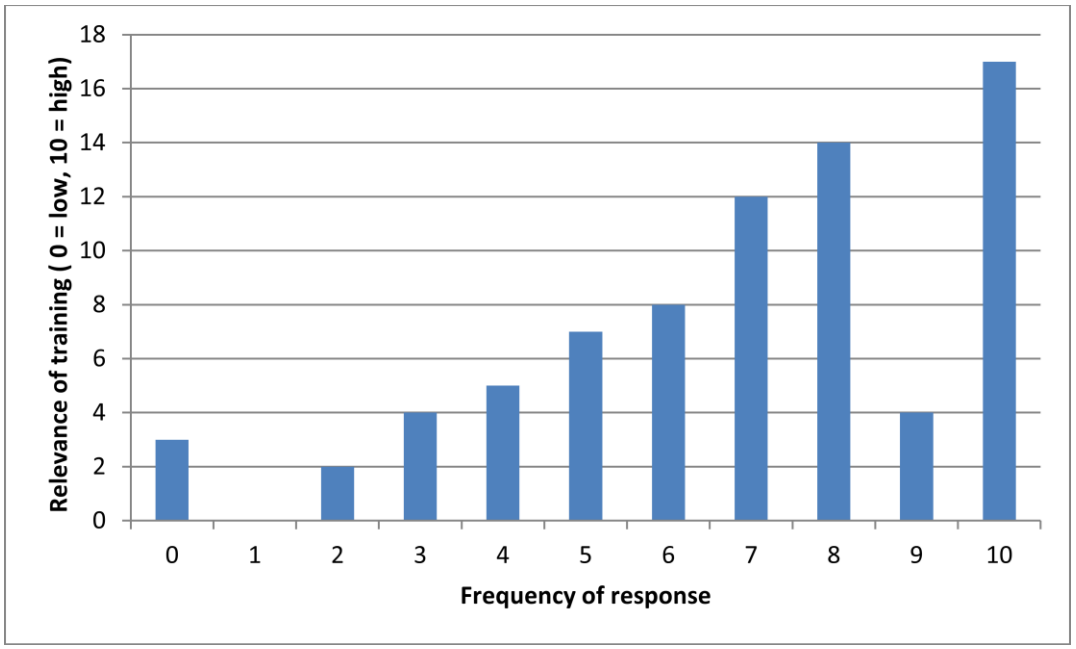
Broken down into sector areas, it can be seen that a greater percentage of teaching staff in Specialist Colleges appear to have received training on embedding sustainability, followed by General FE and ACL.

	Yes	No	Not Sure
Sixth Form College	2 (14 %)	11 (78 %)	1
General FE College	29 (28 %)	69 (68 %)	3
Offender learning	1 (6 %)	15 (94 %)	0
Adult and Community Learning	21 (24 %)	62 (71 %)	4
Work Based Learning	11 (21 %)	38 (72 %)	4
Specialist College	5 (50 %)	5 (50 %)	0

When looking at these figures, it should be recognised that those who completed the survey may have more of an interest in sustainability, and so are more likely to have taken advantage of training in this area. Despite this, numbers of teaching staff having received training is low, at 23 % overall.

Those who had received training were asked How relevant was that training?, rating this on a scale of 0 to 10, with '0' as not at all relevant and '10' as highly relevant.

Responses were varied, with 72 % of respondent rating the training received at '6' or higher.



We asked respondents **"What would have increased its relevance?"**

Common themes include:

- Being able to apply the training; putting it into immediate effect
- Relating the training to subject areas
- Having practical examples
- Open forums for discussions

Would you value receiving training or other relevant professional development with regard to embedding sustainability into teaching, learning and the curriculum?

Yes	221 respondents	(74 %)
No	28 respondents	(9 %)
Not sure	51 respondents	(17 %)
Total	300 respondents	

	Yes	No	Not Sure
Sixth Form College	9 (64 %)	1 (7 %)	4 (28 %)
General FE College	83 (78 %)	11 (10 %)	12 (11 %)
Offender learning	13 (87 %)	1 (7 %)	1 (7 %)
Adult and Community Learning	56 (67 %)	8 (9 %)	20 (24 %)
Work Based Learning	53 (74 %)	6 (8 %)	13 (18 %)
Specialist College	7 (78 %)	1 (11 %)	1 (11 %)

Suggestions for further support to help you to embed sustainability in your course

Survey respondents were able to write any response. Common themes included:

- Relating sustainability to teaching specialism / vocational area
- More practical examples
- More role play and practice

7.3.2.3 Workshop responses

During workshops, participants were specifically asked to consider what extra support or professional development they would find valuable to enable them to embed sustainability into their teaching. The responses are outlined below.

Materials and resources to support teaching staff

- Easy to use materials
- Make basic terms available in a booklet
- Sample lesson plans on certain areas of sustainability

Types of professional development

- Workshops
- Focus groups
- Whole service day / staff day so everyone can contribute
- Online training to encourage participation from all
- CPD in a form of modelling - experts show you how to do it, by demonstration, then you have a mentor to help you with it
- 1:1 help
- Industry experience
- Work shadowing
- Time to think and reflect with colleagues
- Train the trainer
- Someone coming over and flagging up issues is more effective than communications that get lost (e.g. on Moodle)
- Use team meetings to raise awareness of good practice going on
- Collaborative resource development
- Sharing good practice - not just using others' ideas, but learning from them
- Invite others from other institutions - an outside voice has more impact
- Learn from other countries and how they do it
- Self-assess ourselves where we are

Initial Teacher Training

- Educating the educators
- Include in teacher training -"at the moment, there is nothing on sustainability in the PTLLS course, but there is an opportunity as it is being rewritten".

Other comments

- More access to workshops needed
- Embed in all CPD opportunities
- CPD for embedding sustainability would need to be changing constantly and be regularly reviewed
- Include in professional development plans
- Accreditation (professional development)
- Membership of professional institutes
- Refresher teacher training needed for those who haven't had sustainability within their ITT programme

For a selection of resources available online, these are a good starting point:

- Lancashire Global Education Centre - includes various case studies and resources relevant to the FE sector
- Ellen MacArthur Foundation -working towards a circular economy
- Precious Earth – Colchester Institute
- Blackpool and the Fylde College
- SE-ED
- WWF
- Fairtrade Foundation
- UNESCO course (for secondary teachers) on climate change education for sustainable development

7.3.2.4 Expert interviews

Whilst there is a demand for more training, there are a number of good practice examples of how teaching staff are developing their sustainability skills and knowledge through other means.

Denise Summers, Plymouth University Acting Programme Leader for the PGCE CertEd across the partnership of colleges

In a previous job role, Summers used a co-operative inquiry approach with her teacher training team to "develop themselves and their curriculum, to support their trainees" to "embed 'education for sustainable development'" (Summers and Turner, 2011, p. 453). Through the co-operative inquiry, "collaboration…emerged as a key aspect of the inquiry…this emerging sense of collaboration supported Ros in undertaking her first tentative steps. Her initial lack of confidence in her own knowledge acted as a barrier to her incorporating ESD….without the support of the inquiry process, it is unlikely that individual team members would have had the confidence to embed ESD" (Summers and Turner, 2011, p.462).

Marie Eaton, Professor of Humanities and Education, Fairhaven College of Interdisciplinary Studies, US

Fairhaven College in the US is part of a Bioregion project, whereby curriculum faculty groups from different organisations within the bioregion meet 3 or 4 times a year. Faculty groups share readings, so they develop a shared vocabulary so they can understand what sustainability is at a deeper level. One of the reflection group's core themes is "how to sustain ourselves to do the work that needs to be done in order to tackle climate degradation and climate destruction" …reading books such as Joanna Macy and Chris Johnstone's *Active Hope*, the group are trying to look at how to deal with the emotional landscape when people really begin to understand that we're on a path that doesn't look very good" (Eaton, interview February 2013). The group find this approach useful, as they recognise that a common response to realising the vastness of sustainability is to opt-out. To move beyond the simple solutions [of recycling and energy efficiency] involves dealing with our desires to run away from the problem.

Eaton also reflects on the need for teaching staff to shift what learning is about, moving away from transmitting information to thinking. "For many lecturers it's about shifting your idea what learning is about. For lots of lecturers there is this coverage of knowledge in my discipline idea, so it's a kind of shifting to really thinking about thinking. " (Eaton, interview February 2013).

Communities of Practice: TEESNet

TEESNet, formally known as the UK Teacher Education Network for education for sustainable development and global citizenship (ESD/GC), evolved from collaboration with World Wide Fund for Nature UK, Oxfam and teacher educators. In collaboration with London South Bank University and the Higher Education Academy, the TEESNet aims "(1) to develop a UK wide community of practice in ESD/GC and Teacher Education (TE) through which good practice can be shared and disseminated and (2) to contribute to embedding ESD/GC in UK TE institutions" (Inman et al, 2010, p.107)

7.3.2.5 Analysis

There is no doubt that teaching staff want a greater understanding of sustainability to feel they can effectively embed it into their teaching. Without understanding of what comes under the heading of "sustainability", it is difficult to know how to bring it into the curriculum. As Vicky Hutchinson comments from her experience: "after initial training tutors relaxed and commented 'oh, I didn't realise it was that'"(Hutchinson, interview, March 2013). Once this basic level of understanding of the broadness and interconnectedness of sustainability becomes apparent, then a certain amount of clarity is gained through the complexity; an acknowledgment that it is impossible to know everything, which calls on the teaching staff to look for different teaching methods.

This clarity of complexity also brings with it a recognition that sustainability is really an emergent subject, as captured by the WWF (2012):

> "for most subject areas knowledge is changing at such a slow rate during the course of a student's school career that it is perceived as being fixed. This enables teachers to

teach, and students to approach assessments, with a degree of confidence in their understanding.

However, new knowledge is emerging all the time, particularly in areas associated with LfS"

Training or sharing experiences of using different pedagogies would be of real benefit to teaching staff. If the knowledge around sustainability is changing so quickly, the ability to "teach" it becomes incredibly difficult - not only are teachers expected to keep up to date with their specialist area, but also sustainability, which is a large undertaking. Stepping into a learning role alongside learners could help overcome this problem. Summers reflects on the apparent skills gap of teaching staff, "often students and colleagues felt that they didn't know enough. Introducing ESD encourages you as a teacher to take a step back so that you are not necessarily the expert, but you're in it together, and support each other in your development… it encourages a more critical approach to teaching, or facilitative approach" (Summers, interview February 2013). This approach links with some of the values listed in the WWF Framework above.

The learning process for staff in embedding sustainability in teaching, learning and the curriculum could follow a three step process:

1. Understand what embedding sustainability means - core knowledge & understanding; core concepts and principles.
2. Understand how to embed this into teaching. How does this all fit this into specific subject areas? How do specific subject areas fit in with sustainability?
3. How to use this with learners? How can learners be engaged with sustainability in specific subject areas? What links to sustainability are already in the curriculum? What different ways of teaching are needed?

Each step requires different means of support, and professional development to achieve. Example of support and training that could be taken:

- Workshops; information resources; online training
- Subject-specific workshops; case studies of good practice examples; intra-disciplinary support from colleagues and networks; co-operative inquiry groups
- Training in the use of different pedagogical approaches.

It could be recommended that the findings of Joyce and Showers (2002) who thoroughly investigated the impact of staff development on student achievement would be considered when such trainings are being developed. They looked into what types of staff development interventions have the biggest effect and have come up with these findings, which they themselves would describe as rough estimates, based on research:

	Outcomes		
Components	Knowledge (thorough)	Skill (Strong)	Transfer (Executive implementation)
Study of theory	10	5	0
Demonstrations	30	20	0
Practice	60	60	5
Peer Coaching	95	95	95

Training components and attainment of outcomes in terms of present of participants

(Joyce & Showers, 2002, p.78)

Their findings give stark messages and strongly emphasise that apart from what would traditionally be considered training, practice and particularly peer coaching are essential. 'The primary activity of peer coaching study teams is the collaborative planning and development of curriculum and instruction in pursuit of their shared goals." (Joyce & Showers, 2002, p.88)

7.3.2.6 Conclusion

Competences teaching staff require are now beginning to be more understood. The responses given in the workshops, in the survey, and by the sector experts align with those found in the desktop research. A clear path to develop these has also been suggested, with the three step process.

7.4 Section Conclusion

Teacher competences are understood, along with how these could be implemented. Whilst staff training could be made available, and specific to the direct needs and requirements of teaching staff, to do this requires support. As Graham Petersen identifies, "there is a real need to look at ways in which staff training can be made more relevant…and mandatory…To do this, buy in is needed at a strategic level" (Petersen, interview, March 2013). As Graham acknowledges, to embed sustainability requires a degree of support to achieve.

If CPD were offered, would it result in sustainability being embedded in teaching and learning? The next part of this research seeks to understand other barriers that may prevent this from happening.

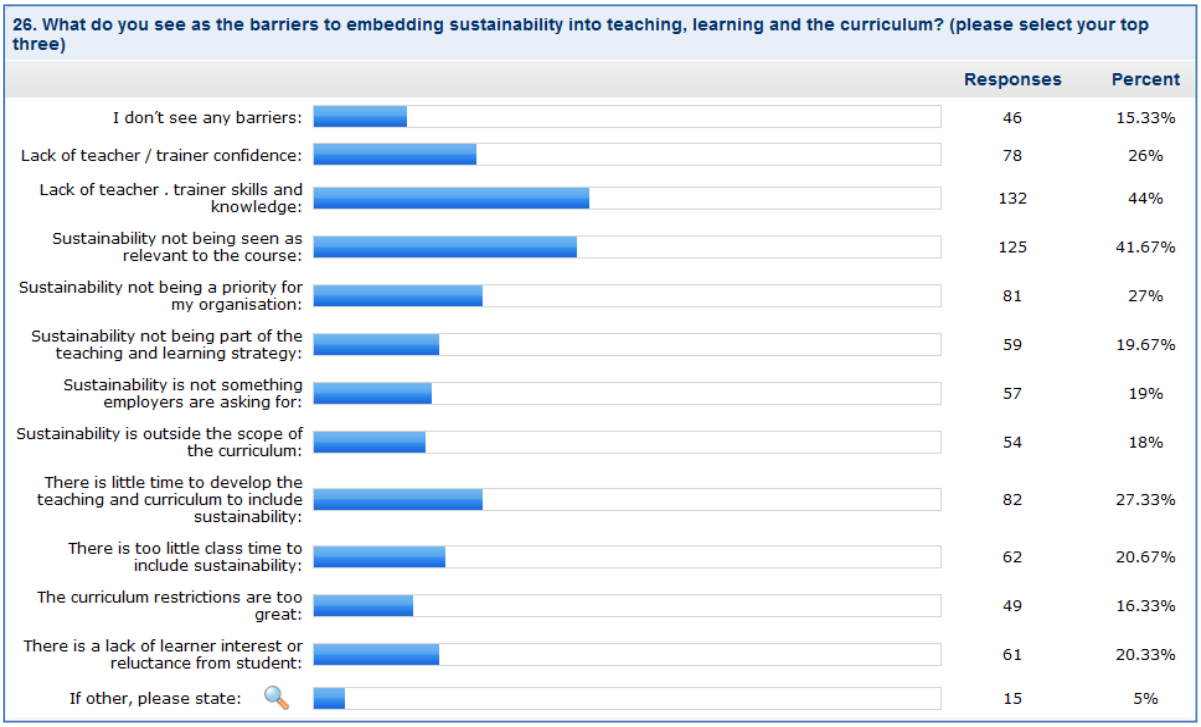
8 Barriers and Solutions

8.1 Introduction

Barriers and solutions to embedding sustainability into teaching, learning and the curriculum were sought through the survey and workshops.

8.2 Identifying barriers

In the survey, respondents were given a selection of options to identify barriers. With this approach, the response to the question "what do you see as the barriers to embedding sustainability into teaching, learning and the curriculum?" were as follows:



Responses in the "other" category included further comments on three main themes:

- Embedding sustainability is not an organisational priority
- Lack of teacher knowledge and understanding of sustainability
- Lack of government support for sustainability

In the workshops, respondents could answer freely, with no pre-determined prompts. This gave an opportunity for un-biased responses, and more depth to the response. A full list of these is included in Appendix 2.

8.3 Grouped identified barriers

The barriers below are drawn from a thematic analysis of all the barriers identified in the survey, in workshops, and in interviews with sector representatives. Where appropriate, quotes from desktop research have been drawn on to articulate the point made. Barriers are grouped here according to theme, and the frequency with which they have been mentioned.

1. **Sustainability understanding and how to translate it into the subject/vocational area**

   Clearly identified in the survey, and mentioned at every workshop, is a response that many teaching staff do not feel they have the knowledge and skills to teach sustainability. Hand-in-hand is confidence to embed sustainability into their curriculum area. A high number of respondents also stated that sustainability is not seen as relevant to their curriculum area. Teaching staff are still struggling with understanding what sustainability means, and therefore find it difficult to know how to embed it into their subject areas, and in such a way that is meaningful to students and influences decision taking and leads to changes in behaviour. This lack of clarity leads tutors to connect sustainability with the seemingly obvious, but much too narrow view, of recycling, resource use and energy efficiency. Related to this lack of sustainability understanding is the question around the degree of urgency that was raised by several workshop groups.

2. **Looking for easy solutions**

   Workshop participants identified "there are no clear answers" as a barrier, along with the barrier of "expectation that there is a solution". Waiting for easy solutions is a barrier. This is further noticed with other requests throughout the research for:

   - easy solutions;
   - clear objectives that need to be achieved;
   - a clear definition of sustainability;
   - teaching resources that can be used off the shelf; and
   - clarity on the messages from scientists for fear that learners get frustrated by what is perceived as contradictory scientific evidence.

   Sustainability is a messy problem in the sense that there are no easy solutions, and there are instances of contradiction if you look at single events of reporting, but if you are looking at the pattern, the trend is very clear. One workshop participant cited "young people get confused by contradictory information".

   "I think it has not got that urgency, and I think that is part of the problem. I also think the facts are very scary and people are not used to thinking in a joined-up, systemic way – they are not thinking what happens when climate that is unravelling intersects with an economy that is unravelling because we have never been there before. We are dealing with chaos theory and complexity and for most people it is too hard." (Carlisle, interview March 2013)

   "Dealing with sustainability means dealing with a mess and most people avoid messes because they feel ill-equipped to cope." (Morris and Martin in Stibbe, 2009, p.156)

3. **Lack of communication and organisational community**

Many workshop participants talked of a lack of effective communication within their institutions. Without good communications, it is difficult to know what the priorities are, what effective practice is going on; if others are interested in embedding sustainability into their teaching too; and how to get involved. This is not purely an issue around embedding sustainability. Some tutors felt that there is a lack of community in their organisation - felt more strongly by sessional tutors who may rarely see other staff due to their teaching hours and locations. In these circumstances, motivation can wane, particularly if leadership is not driving the agenda (also see barrier 5), and those with sustainability responsibilities can feel quite alone.

4. Time constraints

Time was cited as a major barrier in every interview and at every workshop, and it came out as a strong barrier in the survey. This referred to a lack of class time available to include sustainability, within an already busy course, risking squeezing the core curriculum.

The time constraint also included the lack of available time for teaching staff to:

- learn about sustainability;
- think about how it relates to the subject area;
- re-develop lesson plans, or activities to incorporate sustainability;
- reflect on what has worked;
- learn from others, and share good practice; and
- attend CPD and training events.

The barrier of time was also linked to funding and restructures, with fewer staff doing the same work (or more) as before, and working under increased pressure for targets or grades. Contact time with students is high, which leaves little time for lesson planning and for preparation of new material. One survey respondent stated that "currently I have 100 % contact time with students".

5. Institutional leadership and priorities

Senior management are looked to for leadership, and for the mandate for teaching staff to embed sustainability into teaching, learning and the curriculum. 73 survey respondents saw that "sustainability not being part of the teaching and learning strategy" as a barrier to implementation, and 103 survey respondents indicated "sustainability is not a priority for my organisation" as a barrier. Many workshop participants cited *lack of management support* as a key barrier; they acknowledged that unless sustainability featured in the institutional action plan, they did not feel they could pursue the sustainability agenda.

Although it was widely recognised and understood that organisations need to be careful with their finances, the unyielding focus on finance was nevertheless seen as a barrier. One workshop participant stated that "colleges are strapped for cash, and will only invest

if there is a financial return". Another participant gave an example of how this is modelling a culture of waste: "it is cheaper to dispose of items than to repair them". Others also gave examples of their organisations taking "the most cost effective solution, rather than the most sustainable". At a number of workshops, discussions emerged around how to embed sustainability against the backdrop of a culture where "decisions are made on price". Graham Petersen identified that the "lack of trained staff and resources to employ staff to drive this across College on a curriculum basis" was a key barrier to embedding sustainability (Petersen, interview, March 2013).

6. Externally imposed priorities and syllabi

A barrier that is acutely felt across the sector and has been mentioned in every workshop and also by stakeholder organisation representatives is the fact that the priorities for the sector are externally imposed and that staff have no influence on the syllabi that they teach. In the survey, 62 respondents cited "sustainability is outside the scope of the curriculum" as a barrier, and 66 that "curriculum restrictions are too great". In an interview with Professor Frank Coffield, he said: "The big issue is that although FE is qualifications driven, the staff have no control over the qualifications. They are not consulted because the awarding bodies produce the curriculum and they have to teach what's in it whether they like it, whether they think that it is relevant or irrelevant. And all their funding comes from the number of qualifications achieved, so they are trapped and it is the lack of the consultation of the professionals that becomes really important here." (Coffield, interview March 2013)

The current focus is on skills and employability, on restimulating economic growth rather than on a wider education agenda.

"To compete internationally, our education and skills system needs to be producing young people with the competencies, skills and attitudes that make them ready for work. With these in place, individuals can find employment, and once in jobs, are able to work productively. " (BIS, 2012, p.156)

Staff say that there are competing agendas and that those with limiting grades are the priority for them. They also recognise that management are not getting the mandate for this from national drivers. With "initiative overload", sustainability is not seen as a priority against so many competing agendas that are more favoured through funding, policy and Ofsted grading. Sustainability not being an Ofsted priority was experienced as a barrier by many workshop participants.

"And if it is just an extra thing to be ticked off, then it doesn't necessarily mean that they are embedding it well. Teachers already have to embed equality and diversity, literacy and numeracy and if you add anything else teachers will jump off the roof." (Workshop participant)

"Particularly for 16-18 students and the new programmes of study, with all the pressures in trying to deliver outstanding teaching and learning for students, English and Maths, work experience and all with reduced government funding, , it will become even more

difficult for Colleges to embed sustainability. I know this is what concerns most people who are championing sustainability as part of the curriculum offer." (Munro, interview March 2013)

7. Lack of political leadership as a lack of mandate

The lack of national policy drivers has also been identified as a lack of mandate to the sector to prioritise sustainability. Comments that the political system does not favour long-term strategies and therefore leads to short-term thinking were common in the workshops.

"In my view, they shouldn't wait to be given the mandate. If they have to produce cutting-edge shifts and movement, the current system is not designed to allow that to happen. That's why innovators have to have something else that pushes them into attempting to create the new or to create the space for the new to be born." (Martin Kalunga Banda, interview March 2013)

8. Society and culture

Current society and culture are also considered a barrier. Barriers identified included:

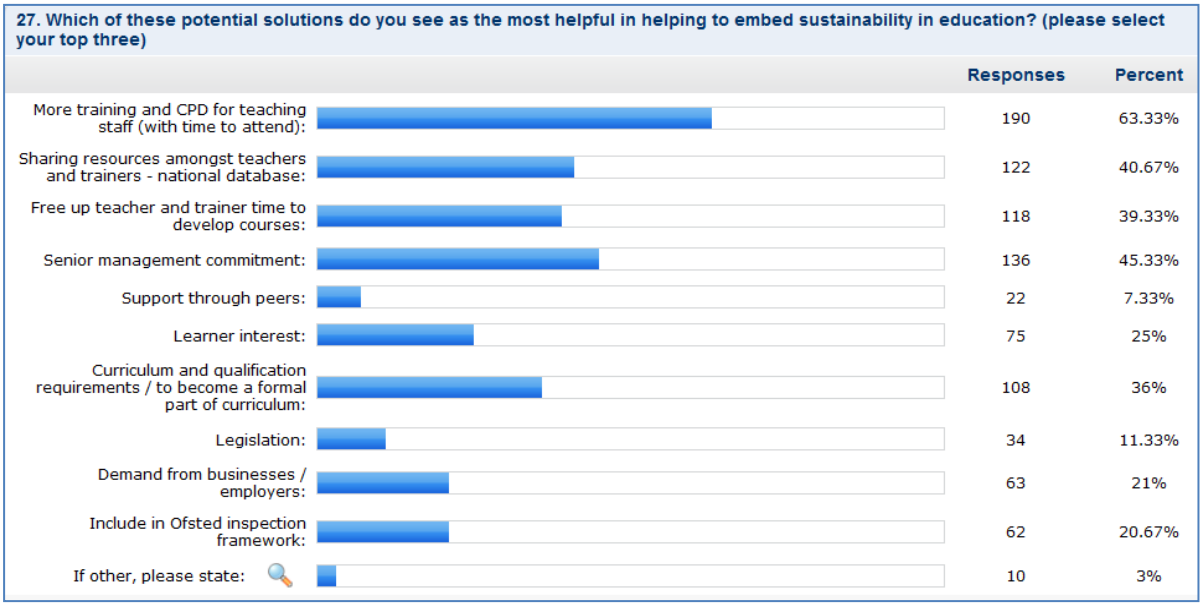
- the whole expected cycle of job – money – house – lifestyle;
- the convenience and instant gratification culture;
- the attachment to this type of lifestyle;
- the resistance that comes with it in the face of change;
- lack of motivation;
- apparent lack of interest;
- lack of personal responsibility;
- lack of acceptance [of the sustainability issues]; and
- students in particular were seen as a barrier in terms of their short-term thinking; their inability to see the long-term perspective. Their focus on just getting the qualification, and no more.

9. **Lack of employer interest**

74 survey respondents suggested a barrier to embedding sustainability is that "sustainability is not something employers are looking for". This was not mentioned in workshops.

8.4 Identifying solutions

In the survey respondents were given a selection of options to identify solutions. The responses to "which of these potential solutions do you see as the most helpful in helping to embed sustainability in education?" were as follows:



Again, in the workshops, respondents could answer freely, with no pre-determined prompt, allowing an opportunity for un-biased responses, and more depth to the response. A full list of these is included in Appendix 2.

8.5 Grouped identified solutions

As for the barriers, the groupings below are determined by a thematic analysis of all the solutions identified in the workshops, survey and interviews with sector representatives, drawing on quotes from desktop research to give more detail. Solutions are grouped here according to theme, and the frequency with which they have been mentioned.

1. **Getting comfortable with not knowing the answers and embracing complexity**

"Teaching" about sustainability requires a mindset shift. There are some key terms and concepts that can be taught, but as Morris and Martin state:

"The health, agricultural, financial and ecological problems we now face are qualitatively different from the problems for which existing scientific, economic, medical and political tools and educational programmes were designed. Without the right tools, learners faced with these wicked problems may fall back on the same old inappropriate toolbox with at best, disappointing outcomes. Given the messy nature of the dilemmas and

contradictions facing us there can be no single recipe and no definitive set of tools" (in Stibbe, 2009, p.156).

Workshop participants recognised this, and saw that the following solutions would assist with this dilemma:

- Confidence building - it's OK not to know all the answers
- Understanding key terms (what does climate change mean?)

As mentioned earlier in section 6, Marie Eaton focuses on getting students to ask better questions about messy problems and giving students messy issues to solve, as giving them solvable problems all the time does not prepare them for how issues show up in reality.

Bill Williamson states "No one knows the answer and it would be pretty dangerous if they thought they did. What we need is a culture of dialogue and debate so that many, many more people can be engaged in the debate" (Williamson, interview March 2013).

Embedding sustainability can change the role of the educator. Denise Summers expands on this from her experiences of encouraging teacher trainers to include sustainability in their teaching: "it encourages a more critical approach to teaching, or a facilitative approach where you're encouraging students to develop their understanding of something…. the teacher has the spark of getting them interested, then they all learn together" (Summers, interview, March 2013).

2. **Make it relevant to subject area and student interest, and accessible to different learners**

Making it relevant to the subject area and capturing learner interest, as well as making the principle of sustainability accessible to different learners, was recognised as very important. Finding places to "drop it in" to the lesson, workshop participants shared examples of using environmental information as the text for word processing practice, or understanding how to read an electricity bill.

Another idea that was mentioned a few times was to set five clear sustainability goals in each subject area.

3. **CPD, support and teacher training**

This was identified by the majority of survey respondents (235), and has been identified as a key strategy in overcoming the barriers. This is explored further in section 7.

This also relates to:

- Allowing teaching staff time - to reflect, develop their courses (144 survey respondents) and to learn themselves.
- Greater access to resources and information (identified as a potential solution by 151 survey respondents, as well as within workshops) -it was suggested that the

Sustainability Exchange could facilitate this, along with links to HE to ensure that resources in HE were also available to FE teaching staff.

- Having some partnership dialogue communication or a mentor to help us progress this within our college.

Training and CPD would also work towards Solutions 1 and 2 above.

4. Integrate into existing organisational procedures and policies

- 164 survey respondents felt that "senior management commitment" would be a solution.
- Sustainability needs to be integrated into existing organisational procedures and policies starting from staff and student recruitments and inductions to teaching and learning policies and tutorials.
- Measurement needs to be implemented - a number of workshop participants said that if sustainability is not included in organisational metrics, it is not considered important.
- A clear mandate from senior management to embed sustainability into teaching learning and the curriculum is required.
- Sustainability needs to be reflected in the key values of the organisation, and the general culture.
- Each department should have a lead on sustainability.
- Tutorial time is considered key for embedding sustainability throughout the curriculum.

5. Improve outcomes for learners while embedding sustainability

Tutors are motivated by learners' achievement and progress. Therefore a solution to getting sustainability embedded is to create concrete links with improving outcomes for learners. Sustainability principles also need to be made sufficiently explicit to learners, so that the learning can be transferred. "If we can have both, if it promotes sustainability and it proves that it gets my learners to learn better, then you have no reason to choose, you have to go with it." (Workshop participant)

6. Keep focused

- At many workshops, teaching staff called for small, achievable steps that could be identified, to break down how to embrace sustainability.
- Workshop participants were concerned that the focus of learning organisations needs to be on the education of the learners, and not the money perspective.
- Sustainability needs to be seen and understood in its broadest terms, and not limited to recycling and energy reduction, for example through discussion of thought provoking questions in class. A recent conversation between one of the authors and a student at Blackpool and The Fylde College backs up this approach. Talking to a student at a sustainability event about what it was that made

sustainability interesting for them, they expressed that it was "the complexity. I thought it was all just recycling before, I didn't realise it included Fairtrade and so much other stuff. This is really exciting" (personal comments).

7. Empower students to have a voice

Developing the voice of the student is also considered central to fostering sustainability and sustainability thinking. This encompasses giving students the skills to question and challenge assumptions and entrenched ideas and to develop and present their own views as well as to get involved in the community.

8. Sustainability team need a clear role

Several workshop participants considered re-establishing or starting sustainability teams as an answer but made it clear that they needed to have a clear role within an overall organisational strategy. This also included sustainability champions where they are additional to a sustainability team. The importance that sustainability does not become the responsibility of a few has also been highlighted.

9. Tap into employer interest in CSR and business ethics

The interest in the business sector in terms of corporate social responsibility (CSR) and business ethics is considered an opportunity to engage with wider sustainability principles.

10. Building teams within and amongst colleges for sharing good practice

Recognising, acknowledging and celebrating what has already been done within an organisation was considered important amongst workshop participants. Not only does sharing help encourage good practice to continue and develop, it also helps to share ideas around, and inspire others, as well as being a way for teaching staff to support each other.

Sharing good practice is considered important not only within organisations but between them. Inviting visitors from other colleges who are further along the sustainability journey has been mentioned as an idea on a couple of occasions. Being able to talk with like-minded people who see the importance of embedding sustainability in teaching, learning and the curriculum is essential.

"(It) is very important that we don't see institutions …as monolithic entities. If there is a battle going on around ideas and culture, we must never think … that these battles aren't going on within those institutions… So it's a question of finding allies, dialoguing with others and building towards a new Zeitgeist." (Selby, interview February 2013)

11. Include in qualification and curriculum, and influence awarding bodies

130 survey respondents stated that a solution lies within "curriculum and qualification requirements - to become a formal part of curriculum". Within workshops, as much as externally imposed syllabi have been identified as a key barrier, so is the influencing and lobbying of awarding bodies considered a possible solution to embedding sustainability, through changing exam syllabi so that sustainability is included in them as a core

component. It is also important that curricula are written in such a way that they allow some freedom to respond to future challenges.

12. **Government backing**

Participants saw that positive government support would help develop the agenda quickly. This could be done by making sustainability a priority for Ofsted, and including sustainability in Ofsted inspection frameworks was identified by 70 survey respondents, and numerous workshop participants, as a potential solution.

Other solutions identified in this theme were:

- Using social media to lobby politicians
- Encouraging students to get involved in local politics and have a voice
- Legislation

13. **Become known for being forward thinking**

One solution is also for organisations to make it their own goal to become the organisation that others look to in this area by ensuring that all learners are given opportunities to gain sustainability skills whilst studying.

14. **Understanding the impact of not doing anything**

This was considered to overcome the barriers of lack of motivation and lack of understanding around urgency. What would the planet be like if we carried on as we are now? Workshop participants also suggested that future generations should be considered in decisions, a concept used by the leadership council of some Native American tribes, which considers the impact of decisions to seven generations on, roughly 175 years.

15. **Demand from businesses and employers**

Seen as a potential solution by 79 survey respondents, and also identified in some workshops.

8.6 Conclusions

Knowing the barriers teaching staff are faced with, and offering solutions to a number of these barriers, is vital to moving forward. The problems are not insurmountable. With commitment from leadership, these solutions could be implemented to effectively support teaching staff to embed sustainability.

9 Leadership

Eminent systems thinker Russell Ackoff (2003) recommends that when systems are being redesigned the focus needs to be on doing the right thing (effectiveness), systems thinking and focussing on what it is that is actually wanted from the redesign. From a sustainability perspective it would probably be prudent to add a condition, i.e. that all of this happens within planetary boundaries, although they may be embraced by doing the right thing. These are quite essential perspectives when looking at embedding sustainability into teaching, learning and the curriculum, particularly as currently, due to financial pressures, there is a tendency to focus on doing things right (efficiency), and on what is not wanted (waste, high emissions, high utility bills) and on piecemeal improvements. "…Piecemeal improvements – improvements of different aspects of a society taken separately – are not likely to improve the properties and performance as a whole" (Ackoff & Rovin 2003, p.2).

Embedding sustainability into teaching, learning and the curriculum therefore needs to be seen as part of the wider organisation and its interrelation with the immediate but also wider community, with partners in the public, voluntary and private sector and with areas seemingly far removed from education such as health or transport.

So what leadership skills are needed to do this? In answering this we need to consider the context of a world that is increasingly complex and interconnected; in which climate stability can no longer be counted on; in which some essential resources such as water are getting scarce; in which poverty remains the daily reality for billions of people; and in which financial systems are destabilised.

Civilisation has never found itself in this situation before and old leadership responses are unlikely to be adequate. "What we are lacking is leadership. I am all for bottom-up and empowering students and teachers. In the end our leaders who are equally human, equally ignorant, equally under-confident need help with stepping up to the challenges to leading a learning organisation in this day and age, with seven billion people on the planet, with many social, economic and environmental challenges. We need to relook at how we train and nurture our leaders. We won't get very far until we are confident that leaders have the wider picture and can inspire staff and the community" (Patton, interview, March 2013).

This section is intended for all leaders: those who have been endowed with an official leadership role and may be part of a leadership team; and those who take on leadership, not as a role, but in an informal way because they feel it is their calling or their duty to do so. Leadership takes many forms - formal, informal, assigned and assumed, as well as distributed. Leadership, just like the tutor role, needs to change in acknowledgement that the system is not out there but that we are the system and that if no one has all the answers then neither can the leader. The leader's role then needs to be about harnessing dialogue, reflection, critical thinking, systems thinking and learning.

"What gives people the sense of agency, the resources, the awareness, the approach and the crafts of practice to take action of some kind in the service of a more environmentally

sustainable and socially just world? We see such leadership as necessarily going beyond conventional notions, because it needs to be able to step outside and challenge current formulations of society and business, and because sufficiently robust change means questioning the ground we stand on" (Marshall, Coleman & Reason ed., 2011, p.6).

9.1 What does this agenda demand from leadership? Responses from workshops and interviews

"If there is no senior management commitment, then it really is incredibly difficult." (Interview with Vicky Hutchinson)

The demands on leadership that have been mentioned in workshops and interviews the most often are:

1. Commitment - truly embedded in all decisions and actions throughout the organisation, not just lip service
2. Prioritising sustainability
3. Leading by example – practising what we 'preach'
4. Investment
5. Active engagement from senior management
6. Clear goals and targets which are monitored and evaluated
7. Incentives, recognition, rewards and celebrations
8. Better communication including consistent communication of the sustainability message
9. Sharing good practice
10. Collaboration and forums for new ideas

"Is it a good example if you drive in 50 miles as a member of staff?" *Workshop participant*

"The council have good incentives. If you decide to walk instead of taking the car, they will still pay mileage allowance *Workshop participant*

Additionally, other factors have been identified:

- A consistent approach
- Believe it yourself otherwise you won't convince anyone
- Compulsory staff training/student learning (induction process)
- Dissemination of information through all levels of the workforce
- Enthusiasm! Introduce an element of fun
- Find out what motivates people to act – passion or external driver (career enhancement, Ofsted)
- Integration
- Leadership needs to come from the senior management team.
- It is more about belief than about knowledge
- One approach – standardise small manageable steps

"We need to bring the educational side into it and not just look at it from a money perspective." *Workshop participant*

- Publicise/reinforce sustainability group
- Support for new ideas/initiatives
- The realisation that sometimes it can cost you money
- Time
- Whole organisation approach - Bottom-up, top-down, side-in approaches

9.2 Leadership for sustainability

This section intends to add some different perspectives to leadership for sustainability. One thing that is clearly needed and is also one of the key sustainability competences for learners is about envisioning different futures. "Improvement of an existing condition or state requires a clear vision of what is wanted, not a clear vision of what is not wanted." (Ackoff & Rovin, 2003, p.2)

9.2.1 Holistic 4 C model

The UNESCO Course Framework and Overview for Climate Change in the Classroom advocates the holistic 4 C model comprising curriculum, community, campus (the physical environment) and institutional culture.

This report focuses on curriculum and through that on some aspects of the community through advocating place-based and community-oriented, experiential and action-based pedagogies.

The sector is already making some progress in terms of campus. Some have ambitious targets aiming to be off the grid by 2020, many have or are starting to agree energy efficiency targets.

"Although there are excellent examples of curriculum development, many providers still find it easier to talk about estates than to think about whole curriculum approaches. Hence many efforts focus on estates: buildings, recycling, double-sided printing etc. where there are tangible benefits, as these actions usually save money as well as carbon" (Ward, interview, March 2013).

More focus could be placed on how the campus could be used for different types of curriculum activities and how the wider community could benefit more from college campus, for instance through showcasing energy saving measures, increasing campus biodiversity or creating orchards or other food growing projects that may lead to social enterprises involving the community.

Also, as mentioned in the introduction to this section, creating a society that flourishes and is equitable and operates within planetary boundaries cannot be achieved by one department, organisation or education sector alone and yet it also cannot be achieved without them. Boundaries have to be viewed as being fluid rather than hard; working across organisational but also societal silos is paramount.

"The sphere of culture is about transforming the 'hidden curriculum' of the institution itself, including its 'business as usual' nature and style of … management and decision-making

mechanisms. Democratic leadership and participatory decision-making processes are encouraged" (UNESCO, 2013, p.10).

Culture is often described as the way things are done in an organisation; what staff talk about when boiling the kettle or when meeting colleagues along the corridor; how decisions get taken; which behaviour is rewarded and which might possibly be punished. Culture can be determined for instance by whether a mechanistic or holistic approach to leadership and management is taken. Decisions on all aspects discussed in this section influence organisational culture.

9.2.2 Mechanistic and holistic styles of leadership and management

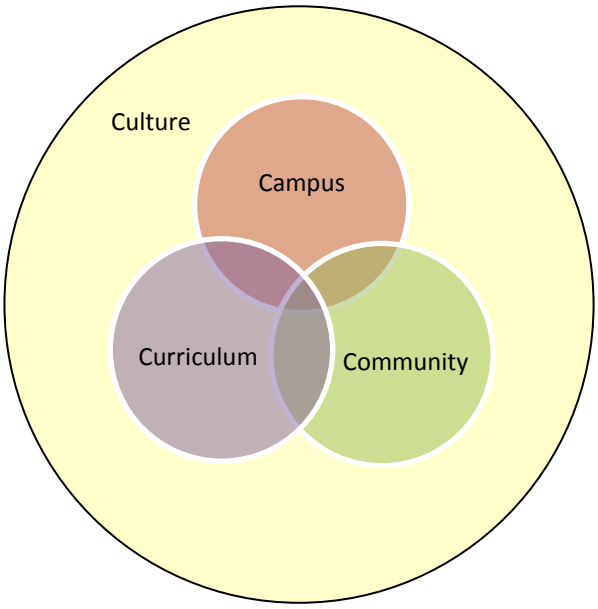
Systems thinking has been identified as a key competence for learners, and so it is for leaders and managers. Systems thinking has its repercussions for how the task of leading and managing is perceived, and it requires a holistic or ecological approach. Sterling (2001) considers many aspects in which a mechanistic management style distinguishes itself from a holistic/ecological one. The former is goal- and product-oriented, and change is to be controlled, and to make that possible the emphasis is mostly on parts; particular action is considered to lead to particular outcomes; the organisational structure tends to be hierarchical; management has a tendency to work in a command and control type manner; and the focus is on problem solving. This style of management can lead to organisations which tend towards standardisation, dependency and being externally directed. On the other hand, a holistic management style focuses on direction rather than goals; is process oriented; facilitates change through a focus on sets of relations and the whole with an awareness of emergence; and has an emphasis on democratic and participative types of working. This tends to lead to diversity, innovation and heterogeneity but also coherence and self-organisation. (Sterling, 2001, p.47)

Of course, leadership and management in any organisation will not be either mechanistic or holistic but most organisations are somewhere along the continuum with an overall tendency towards the one or the other.

9.2.3 Key competences

In effect many of the same kinds of considerations apply to leadership as to thinking about embedding sustainability into teaching, learning and curriculum. The key competences identified in section 6, namely:

1. Systems thinking
2. Long-term, foresighted and anticipatory
3. Stakeholder, group collaboration and wider interpersonal competence
4. Action-oriented and change agent competence
5. Empathy, sympathy and solidarity
6. Coping with uncertainty
7. Normative competence



also apply here in terms of both how the organisation operates internally and how it engages with the wider community. The first three will be explored in more detail here.

9.2.3.1 More on systems thinking

The need for systems thinking has already been mentioned above but there is much about systems thinking that remains unexplored within this report as it is a huge field in itself. One highly important element is, however, what is referred to as leverage points in a system, i.e. the points which can have the biggest effect on change.

These leverage points are important in considering where to focus change efforts. Donella Meadows (1999), key systems thinker and co-writer of the report "Limits to Growth", has highlighted 12 leverage points ranging from high to low leverage. She claims that about 90 to 95 % of attention goes on things such as parameters which in this context may be targets around cutting emissions or setting maximum targets for resource use. She refers to this as "...diddling with the details, arranging the deckchairs on the Titanic" (Meadows, 1999, p.6), and she recommends that attention goes to high leverage interventions that focus on things such as transcending mindsets and changing the goals of the system.

The reason that low leverage interventions are often chosen over high leverage ones is because they are "counterintuitive…Leverage points are not intuitive. Or if they are, we intuitively use them backward, systemically worsening whatever problems we are trying to solve" (Meadows, 1999, p.2).

9.2.3.2 Long-term and anticipatory thinking

Long-term thinking and visions of a good life within the planetary boundaries are needed to propel staff, students and community into action but this vision needs to emerge from this

wider community through collaboration and participation, capturing many complementary perspectives. "…Before we can come up with a credible future vision, we must firstly let go of our egoistic need to be in control and be right. The paradox is that only by embracing uncertainty will the way forward start to manifest." (Confino, 2013, http://www.guardian.co.uk/sustainable-business/transforming-corporate-sector-fear-future accessed 14 April 2013)

9.2.3.3 Collaboration

Collaboration is key to working systemically and because no one person can have all the answers to complex issues. This is about collaboration within and outside organisations as well as across many different sectors. The voices of business, community, students, citizens, local authority, public sector organisations, community groups and NGOs are important, not in isolation but together.

Organisations have many social technologies available to work systemically and collaboratively in new ways including Open Space, World Café, Wisdom Councils, Future Search, Change Labs and many more. "It is this increasing convergence on ideas of complexity, diversity, plurality and interdependence in a socially constructed world of human action that is leading many organisational practitioners to attend to and work with the self-organising, self-referential sense-making interactions of people as the key processes of organisational stability and change." (Shaw, 2002, p.141)

One way of working together and learning together is what Coffield and Williamson (2011) call Communities of Discovery, building on Wenger's concept of Communities of Practice. Wenger et al. (2002) define communities of practice as "…groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis." (Wenger et al., 2002, p.4). Coffield and Williamson (2011) particularly emphasise the importance of democratic principles governing Communities of Discovery and they propose that all educational institutions work towards becoming communities of discovery. They identify 13 main features of such communities of discovery, including that educators and learner are partners in learning; that all educators are learners, and all learners educators; and that learning is the central organising principle of the sector (Coffield & Williamson, 2011, p.49). Many of the features go hand in hand with the sustainability concepts and key sustainability competences highlighted in this report. Learning as the key principle is appropriate to the challenge which can be likened to a plane that is mid-air and needs to change direction and have all its component parts rethought and replaced while the passengers have all different ideas where the plane should be heading.

9.2.4 Transformative change

The Guardian's Jo Confino explains that the lack of transformative change is holding organisations back. "Most large companies do not talk about transformative change because it creates too much fear. Instead they choose to believe everything will be OK if we make current business practices even more efficient. So they focus on iterative steps, such as energy reduction and reduced packaging, and use their PR machines to make these baby steps look like giant leaps. As we all know, the truth can be held at bay for only so long. For a period,

businesses can show good intent by focusing on the low hanging fruit, but these opportunities diminish over time and companies will sooner rather than later have to face up to the real problem – their core business models." (Confino, 2013, http://www.guardian.co.uk/sustainable-business/transforming-corporate-sector-fear-future accessed 12 April 2013)

For leaders to have a transformative effect, they also, just like in transformative learning in section 6, need to be self-aware, recognise worldviews and make choices that represent new or different worldviews. Leadership is equally about being real and operating from the whole person embracing cognitive, somatic, affective and psychomotor domains as well as ethics. Meetings, decision taking and strategies would look very different if these domains were embraced as outlined in section 6.5. Reflection and learning as well as courage are essential components of this leadership.

"We don't want to fiddle around anymore…The responsible thing to do at the moment is to be idealistic in the best sense i.e. to have lots of ideas and demand the impossible. Like the graffiti on the walls in the 60's "Be realistic, demand the impossible!" I think is the most realistic slogan we can work with these days." (Williamson, interview March 2013)

9.3 Conclusion - Mandate or not

It might be argued that all the vision, systems thinking, collaboration and learning as well as head, heart, hands and ethics stuff may not be enough given the perceived lack of mandate that so clearly came across in conversations with the sector. This is why the leadership expert Martin Kalunga Banda was interviewed with exactly that question in mind.

"In my view, they shouldn't wait to be given the mandate. If they have to produce cutting-edge shifts and movement, the current system is not designed to allow that to happen. That's why innovators have to have something else that pushes them into attempting to create the new or to create the space for the new to be born. By its very nature systems in their current state seek to maintain the status quo, so we know that as part of systems behaviour. Change begins where individual leaders initially working as isolated entities eventually realise that a few of them share something in common. But that realisation comes from asking the two strange questions we ask at the bottom of the U-process*: 'Who am I?' and 'What is my work?' meaning 'What is my purpose on earth?', 'What am I here for?' 'Who am I?' is a futuristic question. It is if I wasn't encumbered, if I wasn't inhibited by fear, 'Who is the best me I can possibly be?' and 'What do I see as my work on earth?' As you ask those questions there comes a point of awareness where if the current system does not permit, you either completely leave or begin to think and reflect on ways in which to help the current system to shift. That is at the core of change and innovation. It begins with self-awareness of who I am and what I am here for and who I am and what I am here for is not answered by the system [that] is not willing to move. You reject the notion of the system [that] is not willing to move. When you realise this, you start looking for like-minded individuals within the system until you reach a critical mass to be able to legitimately ask questions and not to be ignored because if you work as a lone ranger your voice is like one in the wilderness and you will not be heard. " (Kalunga Banda, interview March 2013)

* U-process meaning a social innovation process explained in Theory U by Otto Scharmer

10 Recommendations

These recommendations are based on the conclusions and contents of the various sections, taking into account insights from the sector as well as that of the literature that has been reviewed. They are however a summary of what's been said already but for a fuller understanding and a comprehensive coverage it is recommended that the various sections are to be consulted.

10.1 Teaching, Learning and the Curriculum

- See sustainability as a learning journey – we are all on it together, nobody has the definitive answer.
- Get a real understanding of what sustainability means – using the key sustainability competences models as well as the thematic areas to understand the breadth of sustainability, and competences required by learners.
- Start embedding it in your teaching - how does sustainability fit in the subject area, and how does the subject fit into sustainability? See how the different key and generic competences and thematic areas can be embedded within the existing curriculum.
- Experiment with different pedagogies to explore sustainability or to develop key sustainability competences.
- Change how you see your role as a tutor – in a highly complex world, nobody has all the answers to these types of messy problems. Be open to discuss issues that we don't have an answer for (we need clear messages, we need contradictory messages). Become a learner alongside your learners.
- Make it a goal that your students ask better questions about messy problems.
- Think about introducing real-life problems to your learners, rather than neat ones that can be solved easily. Real problems don't show up easily.
- Engage with learners holistically – head, heart, hands and ethics.
- Engage in small-scale action research, or with others in a co-operative inquiry, as a means to reflect critically on changes you are making in your practice.
- Start with small steps but always keeping the bigger goal in mind.
- Get an understanding of systems thinking - using the WWF Linking Thinking resource to start off.
- Use future thinking to start imaging a different reality with learners. What could a good alternative, that has better outcomes for people and is within the means of the planet, look like?
- Collaborate with others, create formal or informal networks – share your learning freely, realising that we can often learn more from mistakes than successes.
- Explore how you can bring in interdisciplinary ways of working by collaborating with other staff and structuring learning around issues rather than topics.

- Get students involved with community issues as the learning task.

10.2 Institution

- Include sustainability questions in daily decision-making. How could the nested model of sustainability or the doughnut model help you to do this?
- Have conversations about sustainability and what it means. Engaging in a process of dialogue and conversations is an important step. Organisational culture does not change from having a policy but from having different conversations, behaving differently towards each other and creating new choices together.
- Work with awarding bodies to change existing qualifications and to create new ones. Call for more flexible syllabi to allow tutors more freedom of syllabi design.
- Be innovative with how to use new opportunities such as the new 16-19 study programme; the innovation code (social enterprises are also businesses); Community Learning Trusts etc.
- Celebrate what you are doing already. Share your practice with others in the organisation and outside it.
- Break it into small steps but keep the big goal in mind, set out in a clear mission statement. Agree what your focus is and make it an organisational conversation, engaging staff in participatory decision making.
- Get the professional FE voice heard in Westminster. Join with others to form a roundtable, like the Roundtable of Headteachers. Are there issues that are worth pushing for? What are they?
- Ensure that there is an institutional mandate for embedding sustainability in the curriculum. Don't wait for a government mandate; take responsibility for learners' future needs. Future learners will be leaving schools with greater sustainability awareness due to the Eco-Schools programme.
- Ensure teaching staff have time to effectively train and do research.
- Provide CPD opportunities on sustainability. Learn from research on what makes for effective CPD, which includes time, plenty of practising opportunities, permission to make mistakes and learn, and peer support.
- Sustainability can be seen as an opportunity; it not being in the Ofsted criteria is a benefit, as institutions can work to what matters, rather than quick wins.
- Review your leadership approaches.

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