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Uncharted waters: voyages for Education for Sustainable Development in the higher education curriculum

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The need to embed Education for Sustainable Development (ESD) in the higher education curriculum is well recognised in international sustainable development dialogues. However, early pioneers in this area have met with substantial obstacles and now face the prospect of attempting systemic education change in a new and difficult sector climate. This article explores the potential for engagement with the higher education curriculum by bringing ESD into its quality assurance and quality enhancement system. It builds on insights gained from a national project funded by the Higher Education Funding Council for England, which worked in collaboration with the UK Quality Assurance Agency and a consortium of five universities. It considers the ways that ESD has entered the UK higher education sector and the potential connectivity that exists between ESD and quality. Key findings are shared from the development projects carried out in these universities, including their identification of specific quality-led pathways for embedding ESD, the differences of perspective uncovered amongst stakeholders and challenges for institutional strategy and implementation. It concludes in reflection on the need to access deeper currents of teaching and learning to make ESD a viable education proposition, as well as the potential transfer to other parts of the education and skills sector.

Keywords: higher education; curriculum innovation; educational system; professional development; curriculum development; learning strategies; pedagogy

Introduction

‘Learning to change for a better world’ is the catchphrase most often associated with the term Education for Sustainable Development (ESD). Underpinning this education movement is a commitment to rethink the purposes of education and to reorient curriculum frameworks and pedagogical practice. Ultimately, it seeks to shift education paradigms and extend learning opportunities so that people can contribute to more sustainable futures (Hesselink, van Kempen, & Wals, 2000; Tilbury, 2010; UNESCO, 2002, 2009, 2010). One of the optimum ‘moments’ for engaging learners with sustainable development is through their experience of higher education: for many, this is the arena for significant encounters with critical thinking, provocative questions and alternative ideas about our current patterns of development and our potential to devise new ways of living. It is fertile space for ESD. However, changing the higher education curriculum is

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recognised to be one of the most intractable, difficult and complex areas of ESD (GUNI, 2011). Much of this is due to structural complexity: the higher education system operates at many levels and has a vast span of expertise. Even grasping the nature of the challenge prior to embarking on these voyages for ESD can cause severe seasickness; very few have tried to sail the seas of higher education or to build the kinds of ships that could make journeys to its farthest shores.

This article charts the potential for more ambitious ESD voyages into higher education. Although small boats have begun to sail these waters, captained by discipline leads or curriculum champions, little strategic progress or systemic change for ESD has happened in universities and colleges, or at the sector level. We argue that for ESD to navigate in higher education, more powerful ships are needed and they can be constructed using quality assurance and quality enhancement. We consider the experiences of five English universities in a unique national ESD project, funded by the Higher Education Funding Council for England (HEFCE) and run in collaboration with the UK Quality Assurance Agency (QAA). These expeditions are set in the English context, but many of the lessons and principles are easily transferable to other national contexts.

Like ESD, the higher education 'quality system' adopts inclusive, systemic, improvement-orientated approaches. These connections offer huge potential for bringing ESD into the core practices, processes and priorities that underpin the higher education curriculum and guide its evolution. The quality system is also an important dimension of the 'whole-institutional' approach to assessing progress in sustainability. However, implementing ESD through a focus on quality brings sizeable challenges for university leadership, academic policy and expert power, as it examines the purpose of learning and current directions of educational travel.

In this article we explain how approaching ESD as an education quality concern is critical to achieving long-lasting curriculum change, as it connects with the main currents flowing through higher education. In this respect, it may prove to be the most sea-worthy vessel for ensuring strategic progress on ESD in higher education and helping the sector to deliver effective learning and innovation for sustainability. This quality-led approach also has the potential to support curriculum change across the broader education sector, particularly as higher education is developing more fluid boundaries with many areas of further education, professional practice and community learning.

Crossing the Rubicon: higher education, ESD and Rio +20

Efforts to embed ESD within our education systems need to be understood within the international context from which ESD emerged. In July 2012, the United Nations *Conference on Sustainable Development* reunited world leaders in Rio, 20 years after they committed to reversing unsustainable patterns of

human activity on the planet and articulated global ambitions for changing the future prospects of humanity. Educators committed to this agenda were reminded of the legacy of the 1992 UN Summit, in the vital signs of the unhealthy relationship between people and planet, as well as public expectations that change is necessary and unavoidable (Blewitt & Tilbury, 2013). At that first Summit, the signing of the Convention on Biological Diversity and the Framework Convention on Climate Change was accompanied by broad pledges to solve some of the most complex problems facing humanity (Tollefson & Gilbert, 2012). Countries also agreed to build sustainable communities, as defined in the document known as Agenda 21, which saw education as critical to the attainment of sustainable futures. This document gave birth to the concept of Education for Sustainable Development, although it did not use the term itself.

Mid-way between those two events, at the 2002 Johannesburg Summit, there was collective recognition of the depth of these challenges and that addressing them would require more than political goodwill or the adoption of new legal frameworks. Increasing understanding of the mindset shifts that would be needed has meant that education regained its importance in sustainable development debates (Tilbury, 2011c). The Johannesburg Plan of Implementation recommended that the UN General Assembly adopt a motion to establish the UN Decade in Education for Sustainable Development (UN DESD). The UN DESD then commenced in 2005 with UNESCO as its international lead and a flurry of activity followed, with the intention of creating national policies and support mechanisms to reorient the existing curriculum and generate professional development opportunities in ESD (Tilbury & Mula, 2009).

The 2012 Rio Summit built upon these themes around education and engaging people, but also had a sharp focus on the 'green economy' and institutional frameworks. It privileged discussions about water, energy and employment, perhaps unsurprisingly given the rise in energy prices, unprecedented concern about water resources and the economic downturn which left many struggling to earn a living. In the Summit outcomes document, *'The Future We Want'* (2012), there were clear gains for education and the ESD movement, despite the disappointment expressed by stakeholders concerned with sustainable development policy and targets. For higher education in particular, an important Rubicon was crossed, which has significance as the end of the UN DESD is now visible on the horizon. ESD discussions reached many forums and ESD was more explicitly located in formal plans and documentation, with higher education entering the arena decisively for the first time. The presence of higher education at these international discussions represented a concrete move in understanding the importance of mobilising academic involvement to support societal change for sustainability. Two important initiatives pointed to the greater presence of higher education stakeholders and how they could help to leverage future developments. The UN-led *Higher Education Declaration* recorded the actions of the leaders of higher education

institutions worldwide and their commitments to improve their sustainability performance. The voices of a broader range of stakeholders were also heard through the *Rio+20 People's Treaty for Higher Education*, facilitated by the Copernicus Alliance and involving higher education agencies, organisations and associations from across the world (Tilbury, 2013).

This ambition to contribute to transformation for sustainability, expressed by an increasingly diverse and vocal network of people involved with higher education, is evident despite (and also in connection with) the economic troubles being experienced by many countries. It reflects deep concern not to allow sustainable development discourses to be diverted onto efficiencies, single issues or the 'green economy' alone, but to ensure that higher education can play its part in extending these discourses and fuelling innovation, helping societies to connect up the dots and take the broad and deep view on sustainability. It is well recognised that in this extremely mobile, ever-globalising and fiercely autonomous sector, declarations alone are no proof of tangible change (Bekessy, Samson, & Clarkson, 2007; Wals & Jickling, 2002; Wright, 2004). Nevertheless, the visibility of higher education at Rio+20 pointed to the growth of shared attention in the sector, to understand how its responsibilities in this area connect with its fundamental role in advancing, integrating and transforming knowledge structures, as well as training and developing the leaders and decision-makers of the future (Tilbury, 2011a).

Sustainable development agendas have been making their presence felt in UK higher education over recent decades and there is now a more supportive policy context in which they can flourish. In England, the HEFCE outlined its expectations in its 2008 strategic statement and action plan *Sustainable Development in Higher Education*. It has also supported national projects through a dedicated funding stream to grow capacity and develop leading practice, as part of its Leadership, Governance and Management Fund. In Scotland, national recognition of the UN DESD was accompanied in 2006 by an action plan for all levels of education, *Learning for our Future*. The Scottish Funding Council has made commitments to sustainable development and the UN DESD, as noted in its Corporate Plan 2009–2012. The Welsh Assembly Government has a longstanding commitment to sustainable development and ESD, as reflected in *One Wales, One Planet* (2009) and its *Education for Sustainable Development and Global Citizenship Action Plan* (2006–2009). It is developing the first piece of UK primary legislation dedicated to ensuring that sustainable development is the central organising principle of government and all public bodies in Wales. The Higher Education Funding Council for Wales leads developments across the sector, including institutional strategic planning and an exercise in curriculum auditing to ascertain engagement with ESD.

Sustainable development is becoming 'part of the fabric', in the sense that universities are routinely attending to sustainability in their environmental management and corporate responsibility practices, to model leading practice in this area (Sterling, Maxey, & Luna, 2013). In terms of their 'footprint' and corporate operations, there has been clear progress,

with sustainability presented as a strategic priority in corporate plans, international declarations and institutional profiles. For example, in Scotland, the Universities and Colleges Climate Commitment for Scotland has been signed by every tertiary institution, representing their commitments to estates practice, community engagement and education in this area. There are increasingly prominent and active cross-sector networks to promote good practice across higher education, such as the Environmental Association of Universities and Colleges in the UK.¹ The growth of attention to performance improvement has also been reflected in the emergence of several awards schemes and ranking initiatives in this area.²

Moving to consider the core academic work of universities, significant developments are evident in the research arena. The sustainability agenda has managed to connect with new trends in research practice, supporting current paradigmatic shifts towards inter-disciplinary and multi-disciplinary research, as well as the use of research methodologies that decentralise expert power, decolonise knowledge and increase participatory approaches (Alvarez & Faruqi, 2012; Tilbury, 2011a; White, 2013). The drive to activate research-based responses to major sustainability concerns, such as poverty reduction, sustainable consumption, ecological resilience, conflict resolution and climate change, is now better supported at the level of infrastructure, via themed funding streams on sustainability that encourage interdisciplinary, inter-sectoral and international collaborations (e.g. Research Councils UK, EU Framework Programme 7, UK Government Department for Environment, Food and Rural Affairs). Furthermore, and amidst contested approaches to measuring the social impact of research in various countries, including the UK, sustainability agendas align with shifts to unleash the transformative power of research for social-structural change, not just technological and behaviour change (Schratz & Walker, 1995; Tilbury, 2011a; Zuber-Skerritt, 2012). However, the higher education curriculum has remained an area of sizeable difficulty and still represents largely uncharted water for the ESD movement, as noted by the Copernicus Alliance People's Treaty (COPERNICUS Alliance & Treaty Circle, 2012). Considering ESD developments within the higher education landscape in England and the way that this sector has engaged with ESD provides a sense of the navigational challenges faced over the years.

Setting sail: the early flotilla and the turning tides

Since the 1980s, sustainable development has begun to appear in the higher education curriculum, first through obvious entry points such as Geography, Landscape Architecture and Development Studies. Some of the early examples included relevant content and topics linked to sustainability, while others moved to embrace the deeper ethos of ESD to change pedagogy and learning processes towards sustainability (Richardson & Ali Khan, 1995). Gradually, experiments began in new subjects, as greater numbers of academics began to understand sustainability as a large-scale ideal related to all areas of the curriculum (Blewitt & Cullingford, 2004; Corcoran & Wals, 2004a; Haslett, France, & Gedy, 2011; Jones, Selby, & Sterling, 2010). Examples of interesting and innovative practice are now shared in a range of

academic publication outlets.³ This broader and more inclusive understanding of sustainability as a learning proposition with relevance across the university curriculum began to take shape, with impetus from the UN DESD and its emphasis on turning the tide in education through comprehensive systemic change. In the UK, the national Higher Education Academy was charged with supporting new work across all subject areas and its ESD Project took up the challenge, working with the sector's network of education enhancement 'Subject Centres' (Sterling & Scott, 2008).

However, this work remained largely the work of enthusiasts – and was therefore vulnerable. Exciting modules often remained optional, with a minority of students on the programme encountering ESD, but no penetration into its compulsory elements or the core thinking of the teaching team. The impact on students might be minimal or contradictory, with sustainability seen as disconnected from the main area of study and students struggling to integrate the concept. Exciting new programmes were established, often with inter-disciplinary learning and radical pedagogies, providing leading edge approaches to ESD at programme level. The danger in this case was of only appealing to those already 'sold' on sustainability and leaving the majority of core programmes in the institution completely untouched. For those who support the impulse of the UN DESD, this is simply not enough: to truly shift higher education systems involves challenging every educator to consider their responsibility and contribution to shaping the world through both formal and informal learning (Ryan & Cotton, 2013; Tilbury, 2013).

Interestingly, the UK landscape for ESD in compulsory and tertiary education has been shifting, under the banner of the UN DESD and other drivers for education policy. This has contributed to a growing climate in which sustainability has been positioned in relation to lifelong learning agendas, with important links to be forged with national directives on skills development and economic growth. In 2010 NIACE produced *Implementing Education for Sustainable Development: Messages for providers of adult learning and skills, and the agencies that work with them* (NIACE, 2010). This was followed in 2011 by the LSIS publication *Sustaining our Future: A framework for moving towards a sustainable learning and skills sector* (LSIS, 2011). From the business community and key industry voices, several reports have been published that highlight the need for industrial growth strategies and business innovation to prioritise sustainability skills and competencies (ASC, 2007; BITC, 2010; British Council, 2011; IBM, 2010; IPPR, 2009; Ipsos-MORI, 2010; SKY, 2011).

Setting to one side new trajectories in compulsory education, which are discussed elsewhere in this collection, the question arises as to whether this ambition of influencing the entire education mechanism is justified and achievable in non-compulsory education.⁴ Responding to sustainability through the fundamental educational thrust of university life certainly requires a mandate and demand from students, if it is to satisfy challenges from academics suspicious of the policy directives that surround cross-cutting education agendas such as ESD. This is particularly relevant in the context of policy changes affecting UK higher education and concerns about the move towards marketised and privatised models of the university (Barnett, 2013; Blewitt, 2013; Collini, 2012). It is all the more necessary, since these shifts are

manifesting in student opinion being taken more seriously as part of the quality assurance process, as evident in changes to practice at the UK Quality Assurance Agency (and fresh approaches being developed by initiatives such as Students Participation in Quality Scotland).

For some time, the picture remained unclear around levels of student interest in sustainability, but recent research commissioned by the UK's National Union of Students and Higher Education Academy has provided interesting indicators. Its initial survey of 5763 first year students across varied subjects found that 80% think sustainability skills will be important to future employers and that 65% want to see this addressed through reframing the existing curriculum rather than setting up special sustainability courses (Bone & Agombar, 2011). A second stage enquiry amongst 1552 first year and 1641 second year students (Drayson, Bone, & Agombar, 2012) affirmed these trends, including the desire for reframing of the curriculum. In these studies, over two-thirds of both groups viewed universities as key players in the delivery of sustainability skills (74.8% of first years and 79.6% of second years, compared to 75% of the initial first year study). The demand-side pull therefore appears to be growing, from both students and industry, but the means of realising the ESD ambition as part of the ongoing revitalisation of the higher education curriculum have so far proved elusive.

Quality ships for ESD in higher education

In popular discussion around higher education and change, universities are often compared to oil tankers, due to their size, slow pace of travel, and inability to turn quickly. The image is applied with negative connotations around the difficulty of changing or diverting these large, impenetrable vessels. However, this neglects the powerful implications of steering universities in directions more supportive of ESD. Identifying their present trajectory and their way of travelling involves focusing on academic quality developments, as these are the main currents that guide the higher education curriculum through its oceans of expertise.

The higher education 'quality system' has two key components, Quality Assurance (QA) and Quality Enhancement (QE), which exist in dynamic interaction. These two aspects of quality occupy the spectrum from obligatory (QA) to optional (QE) processes; with institutions varying in the precise ways they connect and manage the interface between the two (QAA & HEA, 2008). At the compulsory end, QA routines are fairly similar across the sector and are overseen centrally by the national QAA, through regular audits of institutions and the provision of sector-level benchmarks and frameworks. At the invitational end, QE arrangements consist of strategies, initiatives and incentives that are enhancement-led, encouraging curriculum innovation in line with various drivers (which can arise from educational, societal, governmental, industry and professional sources).

QA and QE arrangements continually evolve and institutional 'quality systems' need to be sufficiently flexible to reflect changing academic and professional priorities. 'Quality' in higher education only makes sense when it is interpreted by the community of expert practitioners, aligned with the

historical ground and future aims of each subject area. It is in this sense that quality and ESD have interesting common ground, as ESD is also guided by education principles that are continually evolving and that must be usable by different subject areas. As a relatively new movement, ESD draws upon prior waves of education theory and practice, such as participatory learning, systemic thinking and holistic education, seeking to integrate their pedagogies with the approach to societal and environmental concerns reflected by the global sustainable development movement (Ryan, 2012; Sterling, 2011; Tilbury, 2011b).

To connect quality and ESD means recognising this common ground; that both areas draw upon and seek to integrate the best of education thinking, whilst also being responsive to societal concerns. Both quality and ESD are focused on the ways in which these educational and societal priorities can be channelled across the curriculum to best effect. Although these two areas of education practice have very different roots and spheres of operation, their priorities connect on several fronts. Both are concerned with the *purpose of education*, seeing the need to understand current trajectories and to ensure that this core ethos is reflected in curriculum practice. Both are concerned with the *nature of learning*; they are guided by the existing body of scholarship in education practice and pedagogy. Both are concerned with the *value of learning* and place emphasis on the relevance and usefulness of the curriculum, to ensure that it can provide the greatest benefit for individuals and societies.

For those teaching in higher education, the quality system follows the middle path between constraint and innovation; it requires adherence to routine and the articulation of transparent, effective processes, but it also helps to safeguard the relative freedom of higher education institutions from vested political and commercial interests, in decisions about what and how to teach. For this reason, it is the critical area of engagement for an ESD movement seeking to inform discussions about the kind of higher education we need for the future. Given the fact that there are several levels of shared concern and shared approach, this conversation would appear to be one that is urgently waiting to happen. However, the dialogue is tricky, as it involves specialists from two quite contrasting worlds, where the parameters of operation, span of influence, modes of engagement and range of intentions are far from identical.

This convergence and divergence between ESD and quality makes the intersection between them an important space for curriculum development. Their languages and practices may be different, but if their deeper currents meet, the result could be significant in influencing learning processes in ways that will have credibility and staying power over the long term. If ESD can locate itself in the quality landscape, it will have greater resonance with mainstream academic practice and can channel ESD principles through an emphasis on quality in:

- *the student's experience of learning* (including their motivations, encounters with the formal curriculum, the culture of learning they are exposed to, the environment in which learning takes place, as well as the social learning they experience)

- *the student's contribution to learning* (embracing the diversity of student expertise in higher education and current moves to increase their influence on curriculum development, as well as to extend input from professional and 'real-world' contexts).

In recent decades, higher education has become increasingly subject to new requirements for demonstrable 'professionalisation' of its education function, with attention to academic staff development and teaching qualifications, as well as incentives for the improvement of teaching and learning at sector level (Smith, 2005). As agencies and discourses to manage this professionalisation process have evolved, so has the visibility of education themes at sector level, reflecting cross-cutting agendas to be considered in all subject areas.

Since the UN DESD commenced, higher education agencies have begun to consider ESD in this context, with implications for all faculties, departments and subjects across the sector. In the UK, the Higher Education Academy resourced its cross-discipline ESD Project between 2005 and 2010, commissioning development projects and research studies to explore this area. It then moved to include ESD as a key theme in its *Strategic Plan 2012–2016*. Other agencies prepared the ground by holding discussions around ESD at named events or existing forums.⁵ Many early interventions inevitably remained rather abstract, with conversation revolving around the positive value of ESD and consideration of new practice emerging in specific areas. However, without a clearer sense of how ESD could make sense right across the board in the curriculum of specific higher education institutions, strategic approaches to education change have presented various implementation challenges (Ryan, 2012).

Pushing the boats out: piloting ESD in quality

To launch larger, more strategic ships required an initiative that would connect ESD to the higher education quality system, taking account of sector level frameworks, but generating tangible examples of institutional development in specific universities. A national project to address this need, *Leading Curriculum Change for Sustainability: Strategic Approaches to Quality Enhancement*, was commissioned by the HEFCE and ran from 2010 to 2012, led by the University of Gloucestershire.⁶ It had a specific intention to connect ESD with quality systems, working in close collaboration with the UK QAA and in five institutions (Aston University, the University of Brighton, the University of Exeter, the University of Gloucestershire, and Oxford Brookes University). The project was designed with the aim of generating strategic guidance that would make sense 'on the ground' in universities, as part of their routine work to develop and deliver the curriculum in alignment with externally defined quality frameworks.

Strategic 'systems' responses to ESD have been established in compulsory education in several countries, but this project was unique internationally in tackling this need for institution-wide curriculum

enhancement in higher education. When the project was being developed, few universities had begun to consider ESD in relation to quality; those interested in the issue had started to develop briefings and position papers to gain ‘buy-in’ and increase understanding about how ESD could be part of the institutional commitment to sustainability or to other education priorities, such as global citizenship or public engagement.⁷ The project was designed to scale up engagement with ESD through the QA and QE mechanisms of universities. Its main output was produced as an online practical guide to ESD in curriculum quality, taking perspective at both institutional and sector levels. This resource, the *Guide to Quality and Education for Sustainability in Higher Education*,⁸ shares the experiences, lessons and tools from the five pilot universities, as well as strategic commentary from expert advisers and key sector agencies.

Each of the pilot projects identified ways to embed ESD through the institutional approach to QE and QA, to move it further along that spectrum and secure its foundations as an institution-wide curriculum concern. Their approaches varied, to align with the specific education priorities, academic profiles and corporate concerns of their institutions. The pilots worked with different aspects of their internal QA and QE mechanisms, using both *formal frameworks* (e.g. QA documentation for new course proposals or periodic reviews of courses) and *routine processes* (e.g. stakeholder panels to revalidate courses, monitoring arrangements for quality oversight across faculties). Development work involved staff responsible for quality at two levels: the *institutional level* (e.g. generic learning and teaching strategies, organisational academic staff development provision) and localised *faculty or department level* (e.g. faculty enhancement initiatives, guidance for specific subjects or bespoke work with teaching teams). The project team across the pilots used a shared understanding that ‘quality’ in ESD should mean *connected practice*: connecting theory and practice, connecting practice within institutions, connecting learning and values, and connecting universities with their civic and global responsibilities. To bring this to life, their pathways took account of four dimensions in which the quality system operates:

- *Students* – the learner perspective and graduate profiles or attributes
- *Educators* – the higher education teacher and their professional competences
- *Institutions* – the organisational setting and its specific quality arrangements
- *Externality* – sector and professional frameworks, reviews and benchmarks.

The variety of pilots’ pathways is shown in Table 1, indicating the range of starting points on ESD, dominant corporate agendas and specific quality mechanisms guiding their responses.

To find an appropriate pathway, each pilot had to carefully consider the direction of travel at their institution in relation to cross-cutting themes and to take stock of links between ESD and priorities with educational

Table 1. Institutional quality pathways for ESD.

Aston University

The strategic aim was to influence quality considerations by connecting sustainability education and the University's strategic focus on low carbon delivery and skills for the 'green economy', linking the technological solutions with the pedagogic aspects to extend understanding of what sustainability can mean in the educational context. Internal restructuring necessitated some repositioning of project activities linked to external, local and industry engagement, although its fundamental trajectory remained in working with staff supporting innovation, professional practice and sustainability and producing guidance for academics, managers and external partners.

University of Brighton

The pilot work was focused at the heart of course development processes, to build on an existing platform of enhancement work in ESD in certain areas. The intention was to create effective alignment with other corporate priorities so that ESD could become more firmly embedded in QA through review and validation processes. The project used a cross- departmental team and consulted with course leaders to identify needs and issues, whilst working with senior committees to ensure strategic alignments and formal commitments. Support materials were produced to follow key steps in the cycle of curriculum development that are usable for academic staff.

University of Exeter

The University's ambition to progress ESD was taken forward using a 'case study' approach which reflected the new College structure put in place at the institution. The intention was to produce guidance that could be used in other departments, in line with an overarching ESD strategy. The institutional focus on inter-disciplinary sustainability research provided an additional level of engagement with academics. The chosen department included a flagship course with strong ESD credentials as well as newcomers teaching in mainstream provision. The pilot engaged staff at all levels in discussions around good practice and indicators for ESD, produced guidance materials, actions and recommendations to create an institution- wide approach.

University of Gloucestershire

The pilot work aim was to move beyond grass-roots innovation in ESD and scale up the QA approach in line with the strong institutional credentials in sustainability. The pilot work took place during changes of leadership and the focus was to clarify corporate positioning and create enabling structures to support curriculum innovation. Activities were focused on the place of ESD in formal policies and strategies for QA and QE, engagement with central and faculty QA staff, and producing guidance on ESD in the quality process and in specific subjects as well as new innovation funds.

Oxford Brookes University

Thematic alignment was critical to the pilot approach, which sought to position ESD in relation to the existing institutional commitment to global citizenship. The pilot was dedicated to ensuring that these alignments would be understood and effectively put into practice through existing enhancement mechanisms. The project influenced QA through the institutional graduate attributes scheme, which requires attributes to be reflected in the learning outcomes of all courses. The activities undertaken included collaboration with educational development staff and the production of a teaching and learning guide to support ongoing innovation.

implications such as internationalisation and employability. Achieving 'buy-in' for ESD meant locating it as an education concern in relation to these priorities, showing how it would inform and enhance the institution's academic expertise, recruitment potential and external partnerships. Finding viable points of entry into the institutional curriculum strategy also involved connecting the 'big picture' to a plausible vision for the necessary steps to

implementation and the possible repercussions in relation to institutional quality audits carried out by external reviewers.

The *Leading Curriculum Change for Sustainability* project took place in the aftermath of the Browne (2010) review and attendant changes to the funding of UK higher education. This meant that the pilot projects unfolded in organisations experiencing rapid and often substantive changes to structures, priorities and missions, which posed several challenges for the project leads. However, as has long been observed, ESD involves contested knowledge and challenges to education systems that are influenced by various agendas (Corcoran & Wals, 2004b; Wals & Jicking, 2002). Arguably, any ESD intervention seeking to change what is meant by ‘quality’ in education needs to understand any resistance it meets as part of this provocation, considering the perspectives of different stakeholders as well as the pressures they experience and their needs for support and leadership. The experiences of the pilot projects in this respect should be highly relevant to all efforts at bringing ESD into more strategic position within our educational organisations and practices.

Not plain sailing...stormy seas and competing currents

Universities are complex communities, where different groups contest for space, resources and power (Becher & Trowler, 2001; Harpe & Thomas, 2009). To truly make ESD an institution-wide priority requires that these groups contribute collectively to its integrative agenda. As anyone who has tried to reconcile the interests of such groups will recognise, this is challenging. It involves navigating the space in which institutional corporate planning (and its associated management and monitoring practices) intersects with academic agendas (and their associated innovation and enhancement practices). It also means respecting the ways in which academic autonomy is enshrined at both institutional and discipline levels, protecting innovation but also offering handy platforms for any resistance to change (Bawden, 2004; Corcoran & Wals, 2004b; Cotton & Winter, 2010). Occupying this space for ESD requires leadership and strategy, as well as the engagement of stakeholders and the identification of currents and opportunities specific to the institution.

As the *Leading Curriculum Change for Sustainability* project entered this space, its pilot projects experienced common issues arising from the differences in perspective between ESD stakeholders and staff responsible for quality (in some cases, certain individuals straddled this divide within their own roles). Indeed, ESD stakeholders have varied backgrounds, which influence their perspectives and contributions to institutional ESD, as indicated in Table 2.

The project team also encountered concerns put forward by staff responsible for the oversight of QA and QE at all levels, which prompted

Table 2. ESD stakeholders and curriculum development.

ESD Champions	Educators with experience in ESD and the drive to support it can be an excellent source of good practice, invaluable in raising levels of discussion around ESD in teaching teams and at committees. The potential drawback is that their expertise is often limited to their subject area, which can unwittingly promote the view that ESD is best addressed only in certain enclaves. Ensuring that broader discussion takes place about how ESD principles can be applied in the context of strategic enhancement and assurance activity is critical to achieving broader academic engagement.
Sustainability Researchers	Researchers working on sustainability-related issues are sources of valuable expertise and often extensive knowledge about sustainability topics. However, not all of them will have had prior interest in ESD or be informed about the pedagogic approaches it involves and how to apply these to the curriculum at a strategic level. Given that incentives and opportunities for the transfer of research insights to teaching may be few, their contributions to ESD may be limited in certain institutional contexts.
Committed Students	Students can be critical in driving ESD and petitioning for its place in the curriculum and for their broader learning experiences, although this varies across institutions. The role of students in judging curriculum quality is increasing across the sector, but the influence of students can be ephemeral, with loss of momentum as cohorts move through their studies.
Sustainability Professionals	Staff responsible for corporate sustainability initiatives can play vital roles in galvanising institutional attention and making the broader case for ESD as a corporate priority linked to the overall institutional mission. The drawback is that these staff may lack experience in ESD: many will not hold academic roles or have teaching experience, which can consolidate perceptions of sustainability as an 'estate's' rather than an education issue.

them to rethink the implementation issues behind the broad strategic goals of ESD. It could be argued that universities represent microcosms of education systems, due to their relative independence of operation and need to accommodate diverse expert input from within their own ranks, in response to policy directives, as well as in dialogue with professions and industries. One of the immediate obstacles is that ESD is a relatively young education movement; many QA and QE staff are familiar with pedagogic trends in teaching practice, but have no familiarity with movements such as ESD that aim to influence institutional education practice. In this respect, ESD steps into the space of quality professionals and must make its 'case' in relation to the learning needs of students and their professional ambitions. These critical players in the quality system may have approaches to implementing cross-cutting education themes that do not satisfy the questions ESD asks of curriculum development processes, although they will have valuable insight

into how such generic agendas can be delivered and managed.

To progress their ambitions around ESD, the pilots needed to gain a better understanding of the most important questions from the quality perspective and its tried and tested methods for tackling quality institutionally. Further discussion was often needed about the reasons and benefits for embedding ESD; although for some, the critical issues were practical, in finding equitable and shared ways to implement and manage ESD. Professional knowledge in the quality arena is transmitted through practice and can be implicit, particularly at the interface where QA meets QE, which is the critical space for embedding an innovation-led movement like ESD. Some of the key lessons that emerged were as follows:

- *Quality systems were established with expectations and principles that did not include sustainability so staff are often unfamiliar with thinking related to ESD*
- *Quality staff often respond to sustainability initially as an 'estates' agenda that does not extend into overarching educational oversight via QA or QE*
- *Struggles to view ESD as an underpinning set of education principles can lead to staff believing that 'sustainability' (and therefore ESD) should 'happen elsewhere'*
- *If ESD is established as a corporate priority and articulated in policy, a common reflex amongst QA staff is to view it as a QE matter and to locate it firmly in QE*
- *ESD causes concern if quality staff see it as an extra 'layer' of practice that should be superimposed over and above other priorities, rather than in alignment with them*
- *If staff understand the potential alignments between ESD and other enhancement agendas, they more readily support further embedding of ESD through QA and QE*
- *QA and QE staff look for ESD guidance and tools that are inclusive enough to be used by all subjects and credible enough to be scrutinised by examiners and auditors.*

To summarise, ESD stirs deep waters in universities as it provides an education agenda concerned with informing the overall direction and ethos of the curriculum. This means that it enters into tensions between institutional approaches and subject-specific practices; between different corporate priorities and thematic education agendas; between curriculum strategy and its implementation; and at the interface between formal QA oversight and QE support. The pervasive nature of ESD means that clear communications are essential in attempting to progress its aims. The perception barriers that have to be addressed relate not just to staff who are 'newcomers' to ESD, but also to the quite complex understandings of those who operate at all points in the system. They relate to the need for managers to see the 'why' as well as for educators to see the 'how', and to the need for a staged view of how ESD can develop as an institutional curriculum quality priority. Where institutions

have enclaves of prior experience with ESD, additional confusion can arise, including the need to change direction to create an institutional approach or to counteract misperceptions of its scope and aims.

Dropping anchor for ESD and quality

This article has brought together some of the lessons and experiences of this two-year project, which included one year of pilot work in the five partner institutions. We turn now to reflect on the project achievements and to consider the implications both for higher education and for other parts of the education sector seeking to bring ESD more deeply into thinking and practice about curriculum quality. Looking first at the five pilot institutions, the outcomes shown in Table 3 reflect their varied starting points on ESD and their different strategies to locate ESD within the institutional approach to QA and QE.

These achievements were encouraging, given the one-year pilot process and the fact that the projects took place during significant upheaval in the sector. For some of the institutions, the most important outcomes were not in immediate tangibles but in keeping ESD goals alive in a period of cutbacks and in taking the executive discussion about ESD to the next level as the organisations were rethinking their priorities and plans for the coming years. In at least two of the pilots, presenting ESD as an important education quality issue prompted deeper thinking about the institutional approach to sustainability in general and their strategic positioning in relation to future academic quality audits. For all the institutions, there was attention not only to how ESD should be addressed in itself, but to the ways that it would add value and direction to priority areas such as social responsibility, global citizenship, inter-disciplinary research, community engagement and graduate employability.

The sector level achievements of the project were hugely important and represented a real shift in the level of agency attention to ESD (which also provided legitimisation and context for the pilots in their engagement with their executive teams). The project worked closely with the QAA, who included ESD within the national QA framework, the *Quality Code for Higher Education*, in relation to the strategic approaches institutions take to curriculum development. The QAA also commissioned the development of national guidance, which will be an important tool for benchmarking committees, professional associations, external examiners, directors of learning and teaching, and university partners. Through the dialogue of the project's expert board, plans emerged for greater inter-agency collaboration on ESD, key agencies and opinion formers joined the project dialogues and events, and proposals emerged to use the findings in leadership training and institutional change schemes.

Certain aspects of the higher education system, not least its complexity and the autonomy of its institutions, mean that these quality-led approaches could prove to be particularly powerful. There are however important

Table 3. Institutional outcomes in the pilot universities.

Aston University

Despite substantial organisational change and the need to reposition the project, a set of recommendations was adopted at executive level to progress the embedding of ESD across the curriculum, including the development of KPIs, inclusion in the Learning and Teaching Strategy and staff development. Sustainability was included as one of eight key objectives in the new university strategy, including its alignment with 'green ICT'.

University of Brighton

The existing commitment to ESD was taken to the next level of implementation by addressing its alignment with other education policies, improving staff development provision and curriculum development guidance frameworks. Further systemic effects resulted for the institution, including consideration of the place of sustainability as a key value and using the pilot to lend coherence to existing QA and QE processes.

University of Exeter

An institutional vision to embed ESD was made more explicit through articulation in university strategy, QA frameworks and the environmental strategy. In tandem with this, the pilot developed best practice exemplars in one case study College as a means of extending the embedding process amongst academic colleges, with changes to module planning templates, staff development opportunities and capacity-building events.

University of Gloucestershire

To support the university's profile in sustainability, new executive commitment to embedding ESD through the core QA process was established and dialogues with senior QA and QE staff helped to identify formal monitoring pathways. To move from existing enclaves of practice to a broader institutional approach, a new internal funding scheme was set up to offer development funds to teaching staff for ESD innovation.

Oxford Brookes University

ESD was aligned with the existing trajectory of work to establish university graduate attributes, with the development of guidance and capacity-building events to support the process of revising course description templates to reflect these attributes. The pilot process helped to establish the presence of ESD within the academic staff development unit and to raise levels of engagement with ESD amongst the executive team.

transferable lessons for any education organisation seeking to establish cross-curricular approaches to ESD, especially in the need to explore connectivity with competing policy priorities, to look for timely development pathways and to frame ESD interventions as part of the organisational narrative on education and in relation to the needs of learners and the interests of stakeholders. There are also generic insights into the ways that education professionals engage with ESD, related to perception barriers, development needs and implementation concerns (for example, in identifying initial steps, anticipating where the challenges lie, gaining agreement on shared approaches and plans to monitor progress). One of the most interesting ways in which the quality-led approach to ESD may connect higher education with other parts of the education and skills sector will be revealed through the changes that are taking place at the boundaries of higher education. The increasingly fluid interface between higher and further education institutions, the growth of private and industry providers of higher education and the reshaping of adult and community learning are all arenas in which these strategic approaches could advance ESD through a focus on quality.

Conclusion

The shifts in perception towards understanding sustainability as a learning imperative seem to be far more evident as the last few years of the UNDESSED draw near. It has become clear that for higher education, which is experiencing huge changes resulting from globalisation, the proliferation of new technologies and competition from alternative providers, a tiny flotilla of ESD boats will not survive the tides of global change. As the old saying goes, 'you cannot push the river, but you can go with the flow', and this has been clearly played out in higher education and in the lack of systemic shifts towards ESD in this sector to date. There is a need to revisit the core impulse of ESD for systemic education change, if higher education is to fulfil its role as a beacon for innovation not just through research and operations but by reorienting education and learning processes.

The influence of students in framing curriculum quality agendas is gathering pace in higher education in the UK. Meanwhile, development of the new Higher Education Achievement Report points to the sector's recognition of the value of a rounded learning experience, reflected in graduate profiles. This mirrors the aim of ESD to connect with the experience of university, so that quality learning experiences embrace 'informal learning' and seeing sustainability in practice on campus and as part of core university business. In 2013, initiatives such as the student-led People and Planet *Green League* are turning attention to the evaluation of learning opportunities and curriculum strategies for sustainability, bringing new pressures for institution-wide ESD innovation. The research emerging from both employers and students, about the need for graduates with holistic, action-orientated and globally relevant capabilities for a complex, changing world, is highlighting the need and drivers for strategic curriculum reform in universities worldwide.

Even with sophisticated nautical equipment, these are unpredictable and politically charged educational journeys for the complex 'communities' of higher education, sailing new oceans in an uncertain climate. One of the most useful navigational tools is to approach ESD in higher education using quality as the compass. Finding the currents that connect both ESD and quality can provide momentum for long-lasting education change for this sector, so that ESD adds purpose and supports integration amidst the changing tides of higher education.

Notes

1. Similar international networks include: *Mainstreaming Environment and Sustainability in African Universities (MESA)* in Africa, the *Association for the Advancement of Sustainability in Higher Education (AASHE)* in the USA and *Australian Campuses Towards Sustainability (ACTS)*.
2. In the UK, the People and Planet *Green League*, national *Green Gown* awards and *Learning in Future Environments* benchmarking initiative are joined by sustainability categories in prestigious higher education awards organised by *Times Higher Education* and the *Guardian* newspapers.
3. Prominent examples include the *Journal of Education for Sustainable Development* (SAGE), *Environmental Education Research* (Taylor & Francis) and the *International Journal of Sustainability in Higher Education* (Emerald), as well as online journals such as *Sustainability* and the *Journal of Sustainability Education*.

4. Interestingly, in 2012, Ofsted (the Office for Standards in Education, Children's Services and Skills, which reports directly to the UK government) released new guidance for inspectors, to inform their assessments of the contributions schools, colleges and other learning providers make to sustainable development (Ofsted, 2012). It includes high-level statements to guide the inclusion of ESD in the curriculum and institutional strategy. For tertiary institutions involved in the provision of initial teacher education, there will be implications for the curriculum and for ongoing professional development.
5. For example, the UK Inter-Professional Group facilitated by the Quality Assurance Agency and the Staff and Educational Development Association (which led to its special issue publication 31 on ESD).
6. The project was funded through the HEFCE's unique *Leading Sustainable Development in Higher Education* scheme, the only large-scale curriculum project to tackle ESD strategically at sector level.
7. A review of emerging practice found that some institutions with strategic intentions in this area had undertaken curriculum audits or produced indicative guidance, but none had yet developed ways to assess the implementation or improvement of ESD across the curriculum (Ryan, 2012).
8. The online guide is hosted at the University of Gloucestershire website and can be viewed at: <http://efsandquality.glos.ac.uk/>

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References

- Alvares, C., & Faruqi, S. (Eds.). (2012). *Decolonising the university: The emerging quest for non-Eurocentric paradigms*. Pulau Pinang: Penerbit Universiti Sains Malaysia.
- ASC. (2007). Mind the skills gap: The skills we need for sustainable communities. Academy for Sustainable Communities. Retrieved from http://image.guardian.co.uk/sys-files/Society/documents/2007/10/08/Final_full.pdf

- Barnett, R. (2013). *Imagining the university*. Abingdon: Routledge.
- Bawden, R. (2004). Sustainability as emergence: The need for engaged discourse. In P. B. Corcoran & A. E. J. Wals (Eds.), *Higher education and the challenge of sustainability: Problematics, promise, and practice* (pp. 21–32). Dordrecht, The Netherlands: Kluwer Academic.
- Becher, T., & Trowler, P. (2001). *Academic tribes and territories: Intellectual enquiry and the culture of disciplines*. Milton Keynes: Society for Research into Higher Education/ Open University.
- Bekessy, S. A., Samson, K., & Clarkson, R. E. (2007). The failure of non-binding declarations to achieve university sustainability: A need for accountability. *International Journal of Sustainability in Higher Education*, 8(3), 301–316.
- BITC. (2010). Leadership skills for a sustainable economy. Business in the Community, pp. 1–24. Retrieved from http://www.bitc.org.uk/resources/publications/leadership_skills.html
- Blewitt, J. (2013). ESD: Contesting the market model of higher education. In S. Sterling, L. Maxey, & H. Luna (Eds.), *The sustainable university: Progress and prospects* (Ch. 2). Abingdon: Routledge.
- Blewitt, J., & Cullingford, C. (Eds.). (2004). *The sustainability curriculum: The challenges for higher education*. London: Earthscan.
- Blewitt, J., & Tilbury, D. (2013, in press). *The search for resilience: Journeys in conservation and sustainable development*. London: Earthscan.
- Bone, E., & Agombar, J. (2011). *First year attitudes, and skills in, sustainable development*. Retrieved from http://www.heacademy.ac.uk/assets/documents/sustainability/FirstYearAttitudes_FinalReport.pdf
- British Council. (2011). The Global Skills Gap: Preparing young people for the new global economy. British Council/Think Global. Retrieved from <http://tinyurl.com/globalskillsgap>
- Browne, J. (Chair). (2010). *Securing a sustainable future for higher education: An independent review of higher education funding and student finance*. Retrieved from www.bis.gov.uk/assets/biscore/corporate/docs/s/10-1208-securing-sustainablehigher-education-browne-report.pdf
- Collini, S. (2012). *What are universities for?* London: Pearson.
- COPERNICUS Alliance & Treaty Circle. (2012). The People's Sustainability Treaty on Higher Education. Retrieved January 24, 2013, from [www://insight.glos.ac.uk/sustainability/Education/Pages/People'sSustainabilityTreatyonHigherEducation.aspx](http://www.insight.glos.ac.uk/sustainability/Education/Pages/People'sSustainabilityTreatyonHigherEducation.aspx)
- Corcoran, P. B., & Wals, A. E. J. (Eds.). (2004a). *Higher education and the challenge of sustainability: Problematics, promise, and practice*. Dordrecht: Kluwer Academic.
- Corcoran, P., & Wals, A. (2004b). The problematics of sustainability in higher education: A synthesis. In P. B. Corcoran & A. E. J. Wals (Eds.), *Higher education and the challenge of sustainability: Problematics, promise, and practice* (pp. 87–90). Dordrecht: Kluwer Academic.
- Cotton, D., & Winter, J. (2010). It's not just bits of paper and light bulbs: A review of sustainability pedagogies and their potential for use in higher education. In P. Jones, D. Selby, & S. Sterling (Eds.), *Sustainability education: Perspectives and practice across higher education* (pp. 39–54). London: Earthscan.
- Drayson, R., Bone, E., & Agombar, J. (2012). *Student attitudes towards and skills for sustainable development*. Retrieved from http://www.heacademy.ac.uk/assets/documents/esd/Student_attitudes_towards_and_skills_for_sustainable_development.pdf

- GUNI (Global Universities Network for Innovation). (2011). *Higher education's commitment to sustainability: From understanding to action*. Barcelona: GUNI Higher Education in the World4.
- Harpe, B., & Thomas, I. (2009). Curriculum change in universities: Conditions that facilitate Education for Sustainable Development. *Journal of Education for Sustainable Development*, 3(1), 75–85.
- Haslett, S., France, D., & Gedye, S. (Eds.). (2011). *Pedagogy of climate change*. York: The Higher Education Academy. Retrieved from <http://gees.ac.uk/pubs/other/pocc/Climate%20Change.pdf>
- Hesselink, F., van Kempen, P. P., & Wals, A. (Eds.). (2000). *ESDebate: International debate on education and sustainable development*. Gland: IUCN.
- IBM. (2010). People and skills for a sustainable future: Report based on proceedings at IBM Summit at Start. The Bathwick Group. Retrieved from http://www-05.ibm.com/uk/start-sustainable-future/pdf/people_skills_FINAL.pdf
- IPPR. (2009). The future's green: Jobs and the UK low carbon transition. Institute of Public Policy Research. Retrieved from http://www.ippr.org/images/media/files/publication/2011/05/futuregreen_1737.pdf
- Ipsos-MORI. (2010). Skills for a sustainable economy: The business perspective. Ipsos-MORI Reputation Centre. Retrieved from http://www.ipsos-mori.com/Assets/Docs/Publications/skills-for-a-sustainable-economy-the-business-perspective_170610.pdf
- Jones, P., Selby, D., & Sterling, S. (Eds.). (2010). *Sustainability education: Perspectives and practice across higher education*. London: Earthscan.
- LSIS. (2011). *Sustaining our future: A framework for moving towards a sustainable learning and skills sector*. Coventry: Learning and Skills Information Service.
- NIACE. (2010). *Implementing Education for Sustainable Development: Messages for providers of adult learning and skills, and the agencies that work with them*. Leicester: National Institute for Adult and Continuing Education.
- Ofsted. (2012). *Sustainable development in learning and skills inspections: Guidance for Inspectors*. London: Ofsted.
- QAA & HEA. (2008). *Quality enhancement and assurance: A changing picture*. York: Higher Education Academy. Retrieved from <http://www.qaa.ac.uk/Partners/Employers/Documents/QualityEnhancementreport.pdf>
- Richardson, S., & Ali Khan, S. (Eds.). (1995). *The environmental agenda: Promoting sustainable practice through higher education curricula*. London: Pluto Press, Council for Environmental Education/WWF-UK.
- Ryan, A. (2012). *EfS and holistic curriculum change: Guide for HE institutions*. York: Higher Education Academy.
- Ryan, A., & Cotton, D. (2013). Times of change: Shifting pedagogy and curricula for future sustainability. In S. Sterling, L. Maxey, & H. Luna (Eds.), *The sustainable university: Progress and prospects*. Abingdon: Routledge.
- Schratz, M., & Walker, R. (1995). *Research as social change. New opportunities for qualitative research*. London: Routledge.
- SKY. (2011). The sustainable generation: The SKY Future Leaders Study. Isleworth, Middlesex. Retrieved from http://corporate.sky.com/documents/pdf/publications/2011/sky_future_leaders_study
- Smith, B. (2005). The role of national UK organisations in enhancing the quality of teaching and learning. In K. Fraser (Ed.), *Educational development and leadership in higher education: Developing an effective institutional strategy* (pp. 16–29). London: Routledge.

- Sterling, S. (2011). Transformative learning in sustainability: sketching the conceptual ground. *Learning and Teaching in Higher Education*, 5, 17–33.
- Sterling, S., Maxey, L., & Luna, H. (Eds.). (2013). *The sustainable university: Progress and prospects*. Abingdon: Routledge.
- Sterling, S., & Scott, W. (2008). Higher education and ESD in England: A critical commentary on recent initiatives. *Environmental Education Research*, 14(4), 386–398.
- Tilbury, D. (2010). Change for a better world: Assessing the contribution of the DESD. In *Tomorrow today* (pp. 146–149). Tudor Rose. UN General Assembly in New York November 2010. Paris: UNESCO. Retrieved from <http://unesdoc.unesco.org/images/0018/001898/189880e.pdf>
- Tilbury, D. (2011a). Higher education for sustainability: A global overview of commitment and progress. In GUNI (Ed.), *Higher education's commitment to sustainability: From understanding to action* (pp. 18–28). Barcelona: GUNI Higher Education in the World 4.
- Tilbury, D. (2011b). *Education for Sustainable Development: An expert review of processes and learning*. Paris: UNESCO. Retrieved from <http://unesco.org/education/desd>
- Tilbury, D. (2011c). Are we learning to change? Mapping global progress in Education for Sustainable Development in the lead up to 'Rio Plus 20.' *Global Environmental Research*, 14(2), 101–107.
- Tilbury, D. (2013). Another world is desirable: A global rebooting of higher education for sustainable development. In S. Sterling, L. Maxey, & H. Luna (Eds.), *The sustainable university: Progress and prospects*. Abingdon: Routledge.
- Tilbury, D., & Muł, I. (2009). A United Nations Decade of Education for Sustainable Development (2005–2014): What difference will it make? *Journal of Education for Sustainable Development*, 3(1), 101–111.
- Tollefson, J., & Gilbert, N. (2012). Earth summit: Rio report card 'The world has failed to deliver on many of the promises it made 20 years ago at the Earth summit in Brazil'. Retrieved December 22, 2012, from www.nature.com/news/earth-summit-rio-report-card-1.10764
- UNESCO. (2002). *Education for Sustainability: From Rio to Johannesburg – Lessons learnt from a decade of commitment*. Paris: UNESCO.
- UNESCO. (2009). *The Bonn Declaration UN World Conference in ESD*. Bonn: Germany.
- UNESCO. (2010). *Strategy for the second half of the United Nations Decade of Education for Sustainable Development: Supporting member states and other stakeholders in addressing global sustainable development challenges through ESD*. Paris: UNESCO.
- Wals, A. E. (2002). Sustainability' in higher education: From doublethink and newspeak to critical thinking and meaningful learning. *Higher Education Policy*, 15, 121–131.
- White, R.M. (2013). Sustainability research: A novel mode of knowledge generation to explore alternative ways for people and planet. In S. Sterling, L. Maxey, & H. Luna (Eds.), *The sustainable university: Progress and prospects*. Abingdon: Routledge.
- Wright, T. S. A. (2004). The evolution of sustainability declarations in higher education. In P. B. Corcoran & A. E. Wals (Eds.), *Higher education and the challenge of sustainability: Problematics, promise, and practice* (pp. 7–19). Dordrecht: Kluwer Academic.
- Zuber-Skerritt, O. (Ed.). (2012). *Action research for sustainable development in a turbulent world*. Bingley: Emerald.