OPINION ARTICLE

Integrating education for sustainable development into a higher education institution: beginning the journey [version 1; peer review: 2 approved, 1 approved with reservations]

Richard Howarth[1], Tabani Ndlovu[1], Sihle Ndlovu[2], Petra Molthan-Hill[1], Helen Puntha[3]

[1]Nottingham Business School, Nottingham Trent University, Nottingham, NG1 4FQ, United Kingdom
[2]Higher Colleges of Technology, Happiness Center, Abu Dhabi, PO Box 25026, United Arab Emirates
[3]Centre for Academic Development and Quality, Nottingham Trent University, Nottingham, NG1 4FQ, United Kingdom

v1 **First published:** 04 Apr 2019, **1**:9
https://doi.org/10.12688/emeraldopenres.13011.1
Latest published: 04 Apr 2019, **1**:9
https://doi.org/10.12688/emeraldopenres.13011.1

Abstract

Much of the current literature on integrating sustainability into HEIs is focussed on why HEIs should embrace sustainable development (SD) and what is still missing or hindering work and the integration of efforts. There is much less exploration of how SD has been interpreted at the individual HEI level and action taken as a result. This case study reflects on important elements of the journey Nottingham Trent University (NTU) in the UK has taken to integrate sustainability, focussing on key decisions and activity in 2009/10. In highlighting this, the authors seek to empower those looking to support and/or lead the embedding of Education for Sustainable Development (ESD), separately or as part of an integrated effort, in their own institution. Today in 2019, NTU is a global leader in integrating ESD as part of a wider SD agenda. The work which this paper presents, to understand and establish a baseline of key elements of NTU's existing ESD activity and systems, was an important turning point. Activities undertaken to review and assess 'where are we now?', primarily through an institution-wide survey in 2009/10, led to important insights and supported dialogue, as well as the connection and underpinning of core administrative elements of the NTU SD framework and systems. Further recommendations are given in the final section of this paper on other drivers that can help to embed ESD within an HEI.

Keywords

Higher Education Institutions, HEIs, Sustainability, Strategy, Review and Assessment, Education for Sustainable Development, ESD, Journey, Case Study

Open Peer Review

Approval Status ✓ ? ✓

	1	2	3
version 1 04 Apr 2019	✓	?	✓

1. **Maria Nita**, University of Birmingham, Birmingham, United Kingdom
2. **Rodrigo Lozano**, Utrecht University, Utrecht, Netherlands
3. **Rosemary Horry**, University of Derby, Derby, United Kingdom

Any reports and responses or comments on the article can be found at the end of the article.

This article is included in the Responsible Management gateway.

This article is included in the Quality Education for All gateway.

Corresponding author: Richard Howarth (richard.howarth@ntu.ac.uk)

Author roles: Howarth R: Conceptualization, Data Curation, Funding Acquisition, Investigation, Project Administration, Resources, Supervision, Writing – Original Draft Preparation, Writing – Review & Editing; **Ndlovu T**: Conceptualization, Data Curation, Formal Analysis, Investigation, Methodology, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Ndlovu S**: Conceptualization, Data Curation, Formal Analysis, Investigation, Methodology, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Molthan-Hill P**: Conceptualization, Data Curation, Funding Acquisition, Methodology, Project Administration, Resources, Supervision, Writing – Review & Editing; **Puntha H**: Data Curation, Investigation, Visualization, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: This project was funded internally by Nottingham Trent University.
The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

How to cite this article: Howarth R, Ndlovu T, Ndlovu S *et al.* **Integrating education for sustainable development into a higher education institution: beginning the journey [version 1; peer review: 2 approved, 1 approved with reservations]** Emerald Open Research 2019, **1**:9 https://doi.org/10.12688/emeraldopenres.13011.1

First published: 04 Apr 2019, **1**:9 https://doi.org/10.12688/emeraldopenres.13011.1

Introduction

Nottingham Trent University (NTU) is today one of the leaders worldwide in integrating ESD into core curriculum. In both the 2017 and 2018 UI GreenMetric World University Ranking NTU was ranked in fifth place, scoring full marks in the ESD section in both years. The UI GreenMetric World University Ranking is an initiative of Universitas Indonesia, and universities from around the world are invited to take part, with over 700 institutions ranked in the 2018 survey. Universities are scored against their infrastructure and performance relating to energy and climate change, waste, water, transport, and education. NTU has also been awarded third place in the People and Planet University League (2017), which ranks all 145 UK universities on their commitment to, and management of, sustainability. Again, NTU scored full marks in the ESD section.

In 2016/17, NTU was also the first university to achieve a Gold LiFE accreditation, run by the Environmental Association of Universities and Colleges (EAUC) in the UK. Awards are presented to educational institutions that meet high sustainability standards set by the LiFE Index. The LiFE Index inspects HEIs' approach to sustainability across all aspects of university life, including teaching, research, campus development, waste management, and transport. Furthermore, NTU holds 'Responsible Futures' accreditation from the National Union of Students (NUS), indicating the university's commitment to sustainability within the formal curriculum. The NUS represents 7 million students in the UK. Since 1922, NUS has worked on behalf of UK students and their affiliated unions. The 'Responsible Futures' audit was undertaken by NTU students supported by the NUS and involved working through a range of criteria focusing on sustainability in the formal and informal curriculum.

Such accolades have come to NTU in more recent years, and this paper aims to illustrate earlier turning points in NTU's journey towards a more coherent and integrated approach to ESD activity. In doing so, it is the authors' intention to empower other HEIs and individuals within who want to start, promote or lead a similar journey at their own institution. The main focus of the paper is the *review and assessment* process which NTU undertook in 2009/10. This process can be understood to sit within the 'administration/administrative' dimension of an HEI's Sustainable Development (SD) framework / system (see for example Gomez *et al*., 2015 and Casarejos *et al*., 2017).

As a basic tool for planning, strategy and change, a process of review and assessment of 'where are we now?' can not only support the establishment of clearer and more purposeful objectives, plans and targets but also underpins the allocation of budgets and responsibilities, the (re)shaping of commitment(s) and overall governance (including future monitoring and reporting). These elements are core to SD systems and action as recognised by various authors (Casarejos *et al*., 2016; Gomez *et al*., 2015) but, as Lozano *et al*. (2015) suggest, the appetite for and engagement with such a process is not necessarily as clear nor positive as may be expected.

There is not room to cover the entire journey in detail within this paper; however we hope that with the focus we have, it can provide some useful inspiration and ideas for other HEIs, and interested individuals, to support their journey.

Literature review

Context: general sustainability related action and challenges

Despite scientists publishing unequivocal evidence that unsustainable human practices are increasingly threatening the survival of humanity (Steffen *et al*., 2015; Washington, 2015), efforts to embed sustainability in a broader sense have met lukewarm response from various stakeholders (Exter *et al*., 2013; Winter & Cotton, 2012). Added to this (and a core challenge for many), the word 'sustainability' has different connotations for different people (Engelman, 2013; Smith & Sharicz, 2011). To further compound this, there is a lack of clarity as to how individuals and organisations can put into practice various theoretical conceptions of SD and sustainability (Ndlovu *et al*., 2019). Different and often conflicting stakeholder interests also threaten to undermine and thwart SD and sustainability efforts (Bakker *et al*., 2014; Ferrell *et al*., 2010; Galuppo *et al*., 2014).

The subject of SD, and sustainability, is complex and requires multi-faced approaches by different stakeholders (Exter *et al*., 2013; Winter & Cotton, 2012). There is no one magic bullet and different stakeholders do not need to do the same thing to be sustainable (Mauser *et al*., 2013). As such, action requires contextualisation to be meaningful and relevant to local settings.

These and other challenges have meant that action to become more sustainable is, or can be, a challenge and that it is continuously under negotiation. In the context of higher education (HE), the meaning(s) of SD, sustainability and ESD, and the manifestation of the concepts and actions, can be different, at different stages and may be contested. As a starting point for any HEI, this means for example, that different curriculum areas may focus on different SDGs, SD agendas and/or approaches to ESD and being (more) sustainable. At the same time, core 'operational' areas may also be identifying and addressing different, but related, strands as a result of the importance of these areas (e.g. to benchmarks, reporting and efficiency). Collectively, these steps advancing SD, the ESD agenda and sustainability ought to be encouraged, but activity should (ideally) be integrated; to lead the (administrative) change process, a starting point is needed.

SD action and HEIs: a broad base for action and integration

In his seminal work, Cortese (2003) highlighted the pivotal role that HEIs can play in relation to SD. Because of their operation and reach, especially in relation to education and research, HEIs have a unique position and role not only to address their own direct SD impacts, but also to act as change catalysts to further SD action and engender sustainability thinking. Notwithstanding their potential to act as change agents, HEIs themselves face

many challenges when trying to embed sustainability such as their multifaceted and complex structures (Arbo & Benneworth, 2007; Denman, 2009), as well as the need to 'walk the talk' and not just preach with regard to sustainability (Collins & Gannon, 2014; Müller-Christ *et al*., 2014).

HEI stakeholders, values and evidencing commitment

Casarejos *et al*. (2017) and Lozano *et al*. (2015) unpick the value/role of declarations, charters and initiatives (DCIs) in terms of their interest and importance to HEIs. Lozano *et al*. (2015) specifically identify the role of DCI commitment as important to evidence of wider commitment to SD by an HEI. In doing so, they identify that DCI commitment can support other influential (internal and/or 'local') commitment(s) and they support/underpin other elements of an HEI's SD framework / system (such as: staff engagement; inclusion of SD in the HEI values; mission and plans; budgets and 'resourcing' etc). Casarejos *et al*. (2017) concur, particularly with relation to the importance of HEI commitment(s) and associated policy in supporting the administrative function/element of an HEI's SD system. Gomez *et al*. (2015) further support this in their HEI SD model.

As identified, DCI commitment connects other internal factors, including the HEI's own values. In turn, these values reflect, and are reflected in, the values and associated sense of moral and/or ethical responsibility and obligations of the HEI's leadership and its wider staff, student community and various other communities when it comes to SD (and ESD). Leal Filho (2011) emphasises the importance of understanding and gaining insight into the views of stakeholders and identifies the importance to, and in, SD strategy for HEIs. Aleixo *et al*. (2018) agree in terms of identifying the role of leaders, faculty, administrative staff, students, other stakeholders and stakeholder groups, and gaining insights into their views and attitudes to progress SD (and ESD) in HE. Given that the interpretation of the concept of sustainability has already been identified as a challenge and possible barrier to overall SD action, understanding how various stakeholders view and define SD and ESD (and what is required) is important to change and progress.

Definition of the 'problem', developing insights and guiding the change(s)

The lack of a universally coherent appreciation of sustainability could be put down to different conceptions of SD, different values and, potentially, competing agendas (Robert *et al*., 2005; Santillo, 2007). It is against these factors and impending sustainability challenges that various scholars, in addition to Cortese (2003) have singled out HEIs as key cogs in the sustainability wheel (E.g. Kopnina & Meijers, 2014; Miller *et al*., 2014). This is because, if nothing else, HEIs act as gateways through which students pass and thus HEIs are aptly and ideally positioned to deliver and ingrain sustainability knowledge into students to equip them with knowledge enabling them to take informed decisions (Kopnina & Meijers, 2014). Consequently, engaging students in sustainability dialogue is key for HEIs not only as part of the wider SD agenda but also to gain buy-in and identify and agree on priorities.

To further illustrate direct 'results', and through their individual/collective knowledge and research capacity, it is considered that HEIs can better support all students to take a leadership role in relation to SD (Nicolaides, 2006). Specifically, a key challenge (and thus responsibility) is seen in the need for HEIs to substantially rethink 'the skills future graduate cohorts will need to address dynamic global challenges such as worldwide recessions, ongoing humanitarian concerns, and unexpected ecological crises' (Ryan *et al*., 2010). The 2007-9 global financial crisis for example, can be used as a means to illustrate that HEIs are (were) not doing enough to equip graduates with skills to weigh their decisions on moral and ethical grounds (Swanson & Frederick, 2016).

Ultimately, as suggested previously, different individuals, HEIs and stakeholders may interpret this problem, its elements and their importance, and thus SD and SD-related roles and responsibilities very differently. This causes, or certainly can cause, problems relating to prioritising or focussing strategy in order to address SD challenges and/or to mitigate impacts both in a wider sense and at a local level. In taking this forward, to support administration and governance of SD systems and strategy (e.g. Casarejos *et al*., 2017), and further to gain insight into what forms evidence of commitment within institutional framework (e.g. Lozano *et al*., 2015), Camilleri (2016) identifies the important role of SD working groups with regard to operational insight. In doing so, Camilleri (2016) not only advocates working groups as a means of recognising (and where necessary aligning) the likely (and various?) staff interests but also the role of such groups in debate, discussion and exchange (e.g. of views, experiences etc.).

The operation of these groups and sub-groups clearly supports: commitment(s), values, plans and policies; and reflects resourcing etc (Lozano *et al*., 2015) but also, in the context of change (which SD action in HEIs is), such working groups fulfil the role of, and address a need for, (a) guiding coalition(s) as indicated by Kotter (1996). This was the case at NTU, where such groups did, and continue to, play an important role in driving and supporting the development of the SD agenda and addressing/challenging barriers to action as well as the filling in of gaps in information etc.

Sustainability as a direct problem, challenge and opportunity for HEIs

Owing to their large size and populations, plus the multiplicity and complexity of activities that characterise modern universities and their campuses, HEIs have various and significant direct and indirect impacts on the environment (Alshuwaikhat & Abubakar, 2008; Jabbour, 2010). These include environmental pollution and degradation related to energy and material consumption via activities and operations in teaching and research, provision of support services and in residential areas. All of these impacts could be considerably mitigated or at least reduced by an effective choice of organizational and technical measures (Alshuwaikhat & Abubakar, 2008). Overall, from purely an operational perspective, this makes the SD agenda as

pertinent to HEIs as it is to any other type of organisation. Despite this, and SD gathering momentum in economic development and the HE context, the prevalence of unsustainable practices suggests that there is still ample scope for the development and adoption of SD paradigms and strategies in general and in HE in particular (García *et al*. (2006).

As articulated by Cortese, 2003 (and illustrated recently, for example, by SD models and frameworks generated by Casarejos *et al*., 2017 and Gomez *et al*., 2005) a focus by HEIs solely on the SD-related impacts of their (campus) operations is likely to be, at best, insufficient. As large emitters of greenhouse gases, for example, it is not unreasonable to expect HEIs to address this problem, but such a narrow focus is unlikely to either demonstrate (or support) SD leadership by HEIs (Kirwan, 2010). As such, SD (and the related embrace of ESD) is both an opportunity and a challenge for HE/HEIs. The importance of calibrating SD and 'mapping' the different strands of SD and ESD to an HEI's operations and activities, to prioritise the areas to target, is (and has been for NTU) an important starting point and potential turning point too.

Models, tools and systems

The activities and 'reach' of HEIs in terms of their actual and potential impact, and thus role, connects all dimensions of SD and encompasses: campus operations community engagement and outreach, research, education, and campus experience (see Findler *et al*., 2018 for recent comment on earlier work on this topic by Cortese, 2003 and others). In addition to models, frameworks and strategies proposed for example by Casarejos *et al*. (2017) and Gomez *et al*. (2015), a range of assessment tools exist (see a review of these by Berzosa *et al*., 2017 and also in Gomez, 2015). As illustrated by Berzosa *et al*. (2017) these tools seek to support action by HEIs as well as offer different benefits and challenges.

Due to the importance of shaping and guiding action(s) as well as the mapping of SD (impacts and priorities) by HEIs, there is a role for some form of review or assessment and ultimately for monitoring, auditing and reporting. Lozano *et al*. (2015) clearly identify a place (and challenge in terms of current practice) for assessments related the institutional SD/ESD 'framework' (noted too by Findler *et al*., 2018). Gomez *et al*. (2015), in reviewing the tools available, support this view with a focus on HEIs' (and SD assessment tools') ability to identify the important issues and how the 'problem' (of SD for the HEI) is structured. Casarejos *et al*. (2017) concur with the importance of reviews and assessments of SD (both initial and updates), based on the current and best science available, within the HEI's SD administration system as a part of an HEI's overall SD 'strategy'.

To summarise at this point, both for NTU and other HEIs:

- SD- and ESD-related action is a broad and complex area which presents many challenges, not least due to its overall definition by stakeholders, and is grounded in various reasons for action and also options;
- Commitment is important to the process of change and manifests at various levels (organisational, structural and individual). Interpretations, attitudes and sub-systems, both constrain and lead action(s);
- An important responsibility to support the development of students is identified, and as key stakeholders their views are important. This group (and others) may not currently recognise the importance of SD and/or ESD (hence the role for HEIs);
- Rather than seeing challenges and complexity as barriers, there are benefits from (and an overall 'need' to) establishing the starting point/baseline for action and change;
- Reviews and assessment are important to administrative elements of the HEI's SD/ESD framework or system and there are various options now available (in 2019). Reviews not only support system and framework elements but underpin the structuring of the problem (and opportunities) and insights to the starting point for change (e.g. where are we now? to support discussion of where next, how, etc.); and
- Working and steering groups can play an important role structurally in an HEI's SD/ESD system/framework, but may also be influential in the change process(es) and, for example, reviews.

The NTU case: the role and place of the review and assessment

Case in the context of NTU leading to the new strategy

Prior to the ultimate review and assessment of SD, and specifically ESD, within the curricula in 2009/10 and the work that followed, NTU had for many years, been involved with environment-related action and activity operationally with an appointed Environmental Manager and steering group. In addition to this work, senior and other NTU colleagues had led and supported curricula-related changes, and the Greening the Curriculum Group (GCG) had sought to promote and, where possible, support the further development of specific modules, courses and other work in this area. While the campus-greening work was led by the University's Chief Financial and Operations Officer, Stephen Jackson (who in 2012 won the Business Green Leaders Sustainability Executive of the Year Award), was campus-wide and coordinated via formal plans and targets, the curriculum specific work and activity in 2009 was not integrated, strategically led or coordinated as of yet.

From an environment-specific operations perspective, work in this area had been developing for some time. In 2006, the Senior Management Team had made commitments to the formalisation of the approach to environmental management through the development of its Environmental Management System (EMS), with the aim of external EMS recognition. This had led to formal commitment to work in this area and the establishment of related governance structures. In addition, following the initial

pilot of the approach, NTU engaged with the 'Universities that Count' benchmarking tools initiated by two UK organisations, the charity 'Business in the Community' and the Environmental Association for Universities and Colleges (BITC/EAUC 2007), which, in addition to environment-related actions and outcomes, sought the inclusion of social actions and outcomes, including those focussed on supporting students and related curriculum development(s). The Higher Education Funding Council for England (HEFCE) developed a SD strategy 2005, and its 2008 update, which focussed on the role of HEIs in SD, asserted:

> *"Within the next 10 years, the higher education sector in this country will be recognised as a major contributor to society's efforts to achieve sustainability – through the skills and knowledge that its graduates learn and put into practice, its research and exchange of knowledge through business, community and public policy engagement, and through its own strategies and operations."*

Further to this, the UK Government's Sustainable Development Education Panel had set Further and Higher Education Institutions (FHEIs) the following goals (to be achieved by 2010):

- Be accredited to an internationally or nationally recognised sustainable development systems standard
- Have staff fully trained and competent in sustainable development
- Be providing all students with relevant sustainable development learning opportunities

Due to these pressures, changes and other activities internally and externally and also changes to the membership of NTU's GCG, GCG members sought to re-focus efforts and work to better reflect the SD/ESD role of HEIs (with underpinning from current research, practice and thinking in the area and sector). To support the re-focus the GCG was renamed, to *Beyond* Greening the Curriculum Group (BGCG). As a basis for its work, the BGCG sought to establish the current NTU position to focus actions. As part of this process, the BGCG developed and proposed an NTU position statement/definition of ESD with the following aim:

> *"To ensure that all NTU graduates have engaged and interpreted the meaning and outcomes of SD related to their subject field and/or area of professional practice and that they are capable of contributing to SD and effect change where necessary."*

The BGCG, summarised the NTU position related to various (stakeholder) drivers as below:

Commitment to SD and scoping/informing action

NTU senior management, as part of the new NTU strategy (for 2010), committed to a coordinated and integrated embedding of SD across the university. The BGCG had supported work to inform this approach—specifically, the group identified the importance of a review and assessment to underpin action, what next and priorities. This work essentially sought to ensure that a wider view and understanding of 'where are we now' related to various aspects of SD and ESD and was not just the view of an interested few in the BGCG group. As well as underpinning/informing a sense of urgency (Kotter, 1996), this work could importantly identify gaps between the current status of the institution with regard to action, systems, structures and 'position' in the context of Figure 1.

This proposed review and assessment, followed earlier research on 'sustainability in the (NTU) curriculum' (funded as a specific student research 'project' by the NTU Scholarship Projects for Undergraduate Research scheme (SPUR)). This initial research had offered some insight into current structures and systems (and the embeddedness of SD and ESD), as the project had reviewed and assessed the implementation and governance of SD in the curriculum (and its administrative architecture) via a document review of:

- NTU policies, commitments and plans
- Departmental and college commitments and plans
- Course related commitment plans
- Course related plans and documents (including specifications)
- Module related plans and documents (including specifications)
- Session related plans and evidence (teaching materials etc).

Importantly, the initial SPUR project evidenced the prevalence of SD and ESD related activities and practices within the NTU curricula, as well as the role and influence of NTU's administrative functions and processes for governance (as evidenced by the documents available and reviewed). Essentially, this project and its related review and assessment of current practice(s), etc. offered comment on SD and ESD in the curriculum. However, it did not research or reflect stakeholder attitudes, wider reasons for action/activity, individual and personal views on the importance or otherwise of the issues (to the individual, subject and organisation), actions taken to address SD (at work and outside), student views and attitudes towards SD and ESD and so on.

In addition to this earlier research, the ESD review and assessment was preceded by a formal environmental review of NTU, undertaken for the purposes of establishing the EMS (ultimately to ISO14001 standard), as noted previously. This plan and work met the requirements and goals for FHEIs identified earlier, however it had been driven by environment specific work and activity, which had been ongoing for some time. Importantly, as a result of the requirement of ISO14001, the environment review focussed on the impacts of NTU's *activities*, *products* and *services*, and as a result, the EMS review had (separately) identified education, teaching and research as important environmental aspects (with associated impacts). Within the EMS, these areas/aspects had been deemed 'significant' and thus had

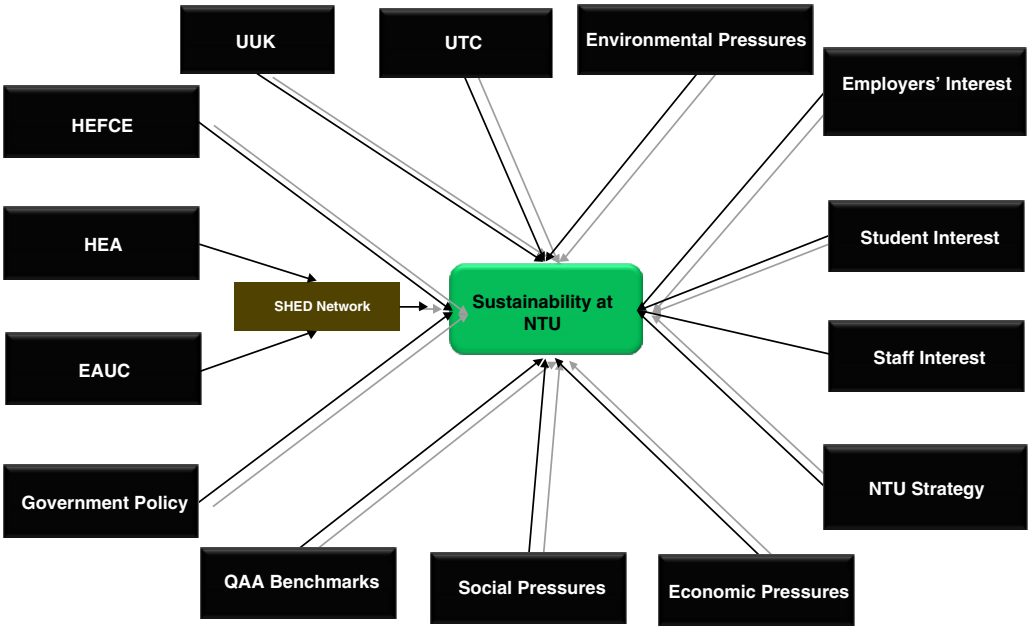

Figure 1. An overall summary of sustainability drivers at NTU in 2009.

been prioritises for address. This insight (and identification of these aspects as significant) was not common practice within HE/HEIs (despite the wider role of HEIs/HE as suggested by various authors, e.g. Cortese, 2003) nor in a wider business sense (where the focus on/prioritisation of 'activities' was common). The inclusion of education, teaching and research within the plans for the EMS, ultimately, was important to work in these areas and led to (and ensured) a wider recognition of the environment and subsequently SD across NTU's reach. The role and importance of the Environment Manager, Grant Anderson, as a member of the BGCG, as a result of the connection, was also recognised and influential.

Designing the review and assessment of SD/ESD at NTU

Process and a comment of the design of the review

At the time (2009), there were few SD and/or ESD models and tools available to NTU and within the BGCG. However, the team felt, with support from the impetus and outcomes of the SPUR and EMS reviews and the developing internal and external context and agenda for this work, that a review and assessment of SD (and ESD specifically within the curricula) at NTU was needed. The review was initially proposed at a meeting of the BGCG in mid-2009. With the agreement and support of this group, a research proposal was developed and a budget identified. This proposal was taken forward for NTU approval by the Environment Manager via a senior management representative with interest in the area as well as members of the BGCG.

In the absence of tools to support/guide action (see Berzosa *et al.*, 2017 for a current update) the working/steering group at NTU proposed the development of their own review and assessment tool and approach. Whilst the tool did elicit wider SD information, the focus was specifically ESD at NTU, the 'architecture' of the current system(s) and, importantly, detailed insights into stakeholder interests, attitudes and responses. The approach proposed was important as the work needed to inform the (individual) HEI's position in this area (not its position against others) and its own status quo. After all, NTU wanted to inform its own 'performance' in the area and understand 'where next' and how to get there, through for example the establishment/strengthening of vision, strategies and plans and, most importantly, priorities and support structures.

To address potential barriers, and also to support the identification of opportunities, the review and assessment approach were premised on a constructivist philosophical approach, which sought to recognise and embrace the various conceptions of sustainability by different study participants at NTU (Fineman, 1996). It has already been highlighted that this can, and does, influence the prioritisation of SD and ESD (and related initiatives) by different stakeholders and consequently, the manifestation of sustainability across NTU. Guided by Oppenheim (1992) for example, questions were designed to underpin insights and description of ESD at NTU.

Overall, the aim and objective(s) of the questionnaire were shaped around 'where are we now':

- Interest in and attitudes towards SD/ESD and role/place of SD/ESD (personally, professionally etc)
- ESD action(s), sources of information, perceptions and evidence of what drives and impedes action etc
- Evidence to support insight to SD/ESD connected to campus and the actual and potential role in ESD
- The capacity for action and the integration of action due to governance, structures, individual leads etc

Important to the 'outcomes' of the review as illustrated within aforementioned literature were:

- The survey was sent to all staff (academic/non- academic) constituting wide stakeholder engagement
- Responses were received from both those currently engaged in and those not engaged in ESD
- Wider stakeholder engagement supported awareness raising and communications (see below too)
- Perceptions of the interest of other stakeholders related to ESD (insights to other sources of support)
- Support for understanding, defining and, thus, the shaping of ESD from a (current) NTU perspective
- Insight to latent potential for further ESD action (e.g. due to personal interest, action outside work etc)
- The importance of identifying capacity and actual/ potential gap in administrative function and system(s)
- The potential to engage and elicit support from, potentially, disengaged, side-lined and other colleagues

Set-up, logistics and resourcing

The project proposed was ultimately approved in late 2009. In addition to the resource of two project leads from the BGCG (one of whom was experienced with audits, EMS systems and strategy and the other whose research and teaching focussed on sustainable business), there were two part-time research posts funded. The time of the two BGCG members was accounted for within the project budget. In addition to other project related costs, the budget for the project (developed and delivered over 3 months) was around £8000.

The initial focus was: the development of the review and assessment approach, the associated design and selection of methods and tools, the data/information collection, and the initial analysis and reporting of findings. The questionnaire, and thus review and assessment (ultimately via the core 'survey'), was premised on a constructivist philosophical approach. As such, it sought to recognise the various conceptions of SD and ESD by different participants at NTU (Fineman, 1996). As noted, this was important, as participants might be individuals with influence over wider prioritisation of SD and ESD initiatives by different NTU stakeholders. Consequently, the manifestation of SD and ESD across NTU amongst other factors was included in the survey design.

To support further dialogue and insights, survey participants (volunteering academic and non-academic staff) were given an option for a follow up interview and/or to receive further information and/or to become (more) involved in work in this area. The latter was essentially a process of self-(s)election to further support work in this area and the BGCG (also see comment on email to Heads of School below). Semi-structured interviews were also arranged with student groups to follow up the initial data capture and deepen insights (note further detail related to these interviews and the follow-on engagement with colleagues is not included in this case study).

While the review and assessment activity was developing, an email was sent from the BGCG via a senior management representative to all academic and other departments:

- Identifying the commitment now made by NTU and the basis of this commitment
- Requesting the identification of representatives for the BGCG from each academic school, ideally willing volunteers, with an interest in ESD and who were willing and able to support the development of ESD at NTU (with an initial focus on the development and formation of strategy and subsequent implementation)
- Seeking further support and engagement with the development and better understanding of current ESD activity within colleges, schools, divisions, courses and modules (via existing structures and reporting at these levels)
- Eliciting guidance/support to take action and support this (e.g. through learning and teaching processes) and supporting the development of case studies, shared materials, etc.

Data capture via survey and administration

To support data/information collection, and ultimately analysis, the review and assessment was constructed using an electronic/ online questionnaire developed by the team and operationalised via Survey Monkey. The questionnaire was purposively distributed via an NTU-wide email link sent to all staff (academic and operational) via the university's global email address book. The email requested and encouraged support and responses from all colleagues (whether engaged with SD related activities currently or not). Ultimately, the study was open for a month in late 2009 with email reminders sent at two-week intervals to those who had not yet responded. In total there were 201 completed surveys, with respondents, split across the three NTU campuses as follows: 71% city staff, 22% Clifton staff and 7% Brackenhurst staff with a 72% response from those classing themselves as 'academic staff' and 28% identifying as operational/support staff.

Overview/insight from selected responses

Stakeholders (students) and SD/ESD

In total, 89% of the academic staff who participated in the survey believed and identified (based on their own assessments) that students were interested in SD and ESD. However, although most staff reported that they had seen evidence of institutional commitment to SD on campus, 30% cited evidence of, for example, SD-related inputs in student inductions. As such the interest in SD evidenced by/in students, as reported by staff, was not recognised and the lack of (apparent) attention by NTU in important events early in a learner journey not only missed an opportunity, it also potentially signalled a lack of interest and/priority for this area for NTU.

In addition, less than half of participants in 2009 said they had seen evidence of SD and/or ESD within the university's student online learning platform (NOW), although over 50% said they had seen evidence of sustainability on the NTU main website. As such, there was general interest, but this did not (appear to) follow through to the curriculum and students. The sporadic integration and recognition of SD and ESD (and overall lack of follow-through of commitments through the architecture) identified in the earlier SPUR project still appeared to pose a challenge.

Extending this further (and despite the importance to external stakeholders and employers), fewer than half of the participants reported having seen sustainability-related placement or career options within the university employability platforms, but over half noted they had seen volunteering options. Such a finding may explain SD and ESD being observed/ interpreted as a marginal issue for some subjects and activities but not others, despite the role of HEIs and apparent interest from stakeholders at the time.

The findings revealed potential missed opportunities relating to knowledge, learning and awareness within the curriculum as well as extramural activities. For example, closer links with and between campus-based activities (and achievements) could be better utilised to illustrate actions and the 'business' case, and benefits of action, through using the campus as a living 'case study'.

SD/ESD in the curricula

In 2009, 73% of academic staff indicated that there was evidence of SD in the modules they led or taught, but content was mainly in the form of reading lists or guest speakers rather than "formal curriculum" content developed and delivered by academic staff. Supporting this, it was identified through other questions and responses that SD activities were largely driven by personal, course theme, student 'needs' (due to subject focus etc) and external factors (professional bodies, employers, etc.) rather than formal NTU drivers/commitments. This supported and expanded on the findings of the earlier SPUR project work. Likewise, most participants reported little evidence of SD and/or ESD at course and core module level and little follow-through to inputs in lectures and seminars. Only limited evidence was reported beyond undergraduate courses, unless there was a specific SD focus to the course (for example, environment). Most activity and evidence were connected to optional modules, topics and/or workshops that were 'voluntary' in nature. As noted above, this evidence further supports the staff sense of SD by students as a marginal and/or an option area and not of prime importance for them (unless chosen) or NTU in a wider sense.

Another notable finding from 2009 was that the environmental dimension prevailed in current and planned 'ESD' content. Notwithstanding the above, respondents indicated that there seemed to be a reasonable balance of environmental, social and economic ESD when ESD was a major theme, research topic or assessed element. That said, SD or ESD did not prevailing as a major theme in many/most courses, modules and inputs and was, as a result, lacking clear attention and focus.

Individual interests/attitude(s) and interpretation(s) of SD/ESD

In 2009, outside the curriculum, respondents cited seeing evidence of initiatives to embed SD through recycling, employee volunteering, green travel initiatives as well as energy management. As such, and for staff/individuals specifically, the evidence and 'relevance' of SD was prominent but primarily related to operational and individual activities. Furthermore, from the 2009 findings, staff personal interest was identified as the significant driver behind SD and ESD initiatives, with 77% of the respondents in 2009 citing this as their primary motivation for action (in the curriculum, their work and beyond). This was set against possible institutional barriers highlighted by 59% of academic respondents who cited, in 2009, a lack of clarity over what, ESD content to teach. 31% of academics in 2009 identified benchmarking problems and 42% of academics cited a lack of coherent institutional approach to the development of SD and ESD-related content as key barriers.

These 2009 findings, and related qualitative comments, offered some insight to the challenges associated with the different interpretations of SD and ESD and also problems associated with understanding (from an NTU-wide perspective), as to what to prioritise (and why) and what scope for flexibility there may be within an overall strategy/system. Added to this, in 2009, 51% of academics cited insufficient time to update courses and 36% financial restrictions in embedding meaningful SD and ESD content into their modules; 34% cited irrelevance of SD and ESD to course leaders (e.g. as 'gate-keepers') as barriers. As such, in 2009, barriers appeared to be structural above all else, suggesting perhaps a lack of direction or 'space' to take/form action.

Of the all respondents in 2009, 38% felt that there were few inspiring examples of SD or ESD across the university and felt isolated in their attempts to come up with initiatives, making things difficult especially from the start. Information sharing on best practice was criticised in 2009 with 69% of respondents indicating that others were not willing to share examples of SD and ESD best practice. This said, overall the results showed a positive outlook towards, and interest in, SD and ESD, albeit patchy and somewhat disjointed in some places.

Essentially, in 2009, to the BGCG there were challenges, barriers and problems, but there was much positive interest in SD and ESD and thus latent capacity.

Discussion and interpretation of the core findings

Sustainability drivers

Contrary to the stakeholder map depicted in Figure 1, respondents indicated that current SD and ESD practices in 2009 were driven more by personal than external stakeholders or formal university drivers. The staff (and student) interests were importantly not divergent from NTU's potential pursuits—a positive finding suggesting that with a more formal approach, the university could tap into this positive personal interest to deliver mutually beneficial results for both the university and the staff concerned. Interestingly, study participants indicated that their SD and ESD actions were also influenced by their home lives, suggesting that the majority of respondents had an inclination

to participate in sustainability-related pastimes outside their work at university.

The perceived lack of coordination of work by NTU resulted in SD and ESD being viewed and interpreted differently, and therefore resulted in, for example, the implementation of strands of SD specifically that appealed, rather than broader conceptions of SD and ESD. This could be a reason behind the patchy approach to SD and ESD which surfaced. A way of harnessing this could be through the creation and clarification of different SD and ESD strands for work and, in addition to sub groups focusing on different areas and activities, such as student and staff inductions, aligned to their interests, responsibilities and potential to contribute (see for example Camilleri, 2016).

Overall, in 2009 the outcomes of the survey suggested a good baseline for further work in this area (with positive attitudes to SD/ESD both at work and outside) that could be tapped into through a more coordinated approach by the university. The overall strategy and approach could (and should) seek both clarity for an overall approach whilst permitting interpretation relevant to different areas. Time and other resources were key to build on the momentum already identified, and a greater willingness and capacity to share case examples, etc., was important. As such, rather than a problem, this was a clear opportunity for NTU to bring together interests and meet the needs of various stakeholders in doing so. A quick (and big) win (Kotter, 1996) if ever there was one!

Wider appreciation and interest (not just 'academic')

Overall, the study findings indicated a positive appreciation of SD and ESD across both academic and operational staff at NTU, demonstrating a possibly fertile environment for further embedding SD and ESD. The key issue to be addressed, however, seemed to be a more coherent, coordinated, integrated and inclusive (and empowered/empowering) institutional approach by NTU to offer a clear strategy and system/framework moving forward. At the time of the study in 2009, SD and ESD at NTU were championed by the BGCG steering group, almost in isolation. The wider representation from colleagues around NTU in the BGCG, and other activity to support the work in this area (linked to the structure and administration of the strategy), signalled NTU's overall and greater commitment, not only to understand and establish a baseline of current SD and ESD performance, but to act to take its strategy forward in a meaningful and informed way. A way, a strategy and a system, which included various stakeholders and their interests rather than a few.

Sustainability policy and coordination

Overall, the BGCG supported the establishment of a baseline understanding of, and insight into 'where are we now?' and thus what problems existed and what changes were needed related to 'where next?' and 'how to get there?'. Therefore, the BGCG supported developing a more coordinated and integrated approach to embedding ESD in the university's curriculum, as well as inputs in other operational areas. Despite there being no formal overarching SD or ESD policy across the various parts and activities of NTU at the start, the review and assessment of its position (and interpretation and reporting of findings to senior management) indicated clear evidence of good practice (albeit patchy and somewhat inconsistent). This provided the basis and a clear opportunity for NTU to move forward, and in doing so, share best practice areas internally and externally and support what was already an interested group of stakeholders on fertile ground.

Conclusion

The intention of this case was to offer some historical insight into a key element of the journey of NTU in pursuit of its SD and ESD strategy and the integration of its work in this area. It is hoped, at the same time, that it may offer some inspiration for others HEIs or individuals. This is because, the 2009 review and assessment documented various challenges and opportunities faced by NTU. The work in 2009 was important (e.g. for insights into the NTU position and a deeper appreciation of 'where are we now'), but ultimately it was only one part of the strategy and activity relating to ESD at NTU. Documenting (at the time and here) this early part of the journey (from 2009/10) should illustrate the approach taken (and the context for action too) and that the journey was not without challenges. Like elsewhere, NTU and its work on SD and ESD had to start somewhere and knowing/gaining insight to the starting point was an important element.

Important discoveries in 2009 underpinned the administrative function of the NTU SD/ESD 'system' and also many of the actions that followed. Stakeholder engagement and dialogue was key in 2009 influential to the change process as it supported a wider sense of the need to change and supported the development of various coalitions. In 2009, on the surface there were apparent problems and/or differences in opinions, attitudes and behaviours. It was important to recognise these, and strategies were developed to address them. This was because the apparent variety and challenges identified in 2009 was more an opportunity than a barrier to subsequent action.

The assessment of capacity/latent capacity in 2010 was key to moving forward, along with a sense of vision and urgency. Seeking to understand and interpret gaps and barriers was of great benefit at the time and since. As was seen in 2009 at NTU, commitment manifested at various levels and worked best when aligned (through the emerging strategy and action). Finally, being able to define and clarify what was understood about ESD and SD and how they were defined at time in 2009 in for an HEI and more specifically NTU was key to moving forward and confidence for the future.

Recommendations, reflections and limitations: Starting the journey

As shown in this paper, the survey in 2009 was important in designing the journey we wanted to take, in the following we have outlined some reflections on the key steps taken in 2009/2010.

Steering/working group

It all started with finding some like-minded people; they can be from any background as this offers synergies. In our case we

were mostly academics in 2009 but found a strong ally in our environmental manager. The background of the employees in the steering group will offer different routes on how to get ESD integrated into an HEI. In our case, in 2009 we made a strong case for how it would support the environmental credentials we had already achieved in our estate.

Lack of senior management buy-in

Many researchers and colleagues from other HEIs believe that you cannot start this journey without senior management buy-in. Our experience is different. Today we have a senior management who is driving the sustainability agenda; however, back in 2009 this commitment was not as clear. In our experience useful arguments in 2009 for integrating SD and ESD included accreditation, reputation, efficiencies, staff interest, the student voice, sector strategy. etc.

Mapping

Mapping of SD and ESD across curriculum can take different forms, for example it can be based on a staff survey as described earlier in this paper. Many HEIs start the mapping process with analysing their area, course(s) or module documentations such as handouts or documents required as part of the quality assurance process. There are various tools and models available, but key to this is understanding where the (individual) HEI is at a point in time to support and underpin future action. There is nothing better than getting started! Today the SDGs offer an excellent framework to integrate ESD into the curriculum but also to use as a framework to establish a baseline and measure progress (see Willats *et al*., 2018).

Building on existing work related to ESD

One purpose of the mapping process should be to discover some of the strengths the university might already have in ESD and also the possible barriers and opportunities too. Therefore, it is advisable to include the opportunity for colleagues in a survey or other review and assessment or mapping exercise to share best practice if they want to do so. This way, pockets of good practice will be discovered and could be extended into wider offerings or replicated in other disciplines.

Data availability

No data are associated with this article.

Author information

Many recommendations for next steps such as the need to design a good strategy could follow but the above are the key steps in our opinion to start the journey; please contact us at Green.Academy@ntu.ac.uk if you would like further information or support.

We wish you a good journey!

Grant information

This project was funded internally by Nottingham Trent University.

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

References

Alshuwaikhat HM, Abubakar I: **An integrated approach to achieving campus sustainability: assessment of the current campus environmental management practices.** *J Clean Prod.* 2008; **16**(16): 1777–1785.
Publisher Full Text

Aleixo A, Leal S, Azeiteiro U: **Conceptualization of sustainable higher education institutions, roles, barriers, and challenges for sustainability: An exploratory study in Portugal.** *J Clean Prod.* 2018; **172**: 1664–1673.
Publisher Full Text

Arbo P, Benneworth P: **Understanding the regional contribution of higher education institutions: A literature review**. *A research report prepared for the OECD Institutional Management in Higher Education Programme "The contribution of higher education to regional development".* OECD IMHE. 2007; 2007.
Publisher Full Text

Bakker S, Maat K, van Wee B: **Stakeholders interests, expectations, and strategies regarding the development and implementation of electric vehicles: The case of the Netherlands.** *Transp Res Part A Policy Pract.* 2014; **66**: 52–64.
Publisher Full Text

Berzosa A, Bernaldo M, Fernandez-Sanchez G: **Sustainability assessment tools for higher education: An empirical comparative analysis.** *J Clean Prod.* 2017; **161**: 812–820.
Publisher Full Text

Camilleri M: **Corporate sustainability and responsibility toward education.** *Journal of Global Responsibility.* 2016; **7**(1): 56–71.
Publisher Full Text

Casarejos F, Fronta M, Gustavson L: **Higher education institutions: a strategy towards sustainability.** *International Journal of Sustainability in Higher Education.* 2017; **18**(7): 995–1017.
Publisher Full Text

Collins D, Gannon A: **Walking the eco-talk movement: Higher education institutions as sustainability incubators.** *Organ Environ.* 2014; **27**(1): 16–24.
Publisher Full Text

Cortese AD: **Critical role of higher education in creating a sustainable future.** *Planning in Higher Education.* 2003; **31**(3): 15–22.
Reference Source

Denman B: **What is a university in the 21st century?** *Higher Education Management Policy.* 2009; **1**: 9–28.
Publisher Full Text

Engelman R: **Beyond Sustainababble**. In *State of the World 2013.* Island Press, Washington, DC. 2013; 3–16.
Publisher Full Text

Exter N, Grayson D, Maher R: **Facilitating organizational change for embedding sustainability into academia: a case study.** *J Manag Dev.* 2013; **32**(3): 319–332.
Publisher Full Text

Ferrell O, Gonzalez-Padron T, Hult G, *et al.*: **From market orientation to stakeholder orientation.** *J Public Policy Mark.* 2010; **29**(1): 93–96.
Publisher Full Text

Findler F, Schonherr N, Lozano R, *et al.*: **The impacts of higher education institutions on sustainable development: A review and conceptualization.** *International Journal of Sustainability in Higher Education.* 2018.
Publisher Full Text

Fineman S: **Emotional Subtexts in Corporate Greening.** *Organ Stud.* 1996; **17**(3): 479–500.
Publisher Full Text

Galuppo L, Gorli M, Scaratti G, *et al.*: **Building social sustainability: multi-stakeholder processes and conflict management.** *Social Responsibility Journal.*

2014; **10**(4): 685–701.
Publisher Full Text

García FJ, Kevany K, Huisingh D: **Sustainability in higher education: what is happening?** *J Clean Prod.* (Editorial). 2006; **14**(9–11): 757–760.
Publisher Full Text

Gomez FU, Saez-Navarrete C, Lioi SR, *et al.*: **Adaptable model for assessing sustainability in higher education.** *J Clean Prod.* 2015; **107**: 475–485.
Publisher Full Text

Jabbour C: **Greening of business schools: a systemic view.** *Int J Sust Higher Ed.* 2010; **11**(1): 49–60.
Publisher Full Text

Jorge ML, Madueno JH, Cejas MY, *et al.*: **An approach to the implementation of sustainability practices in Spanish universities.** *J Clean Prod.* 2015; **106**(1): 34–44.
Publisher Full Text

Kirwan W: **The 21st Century: The century of the American research university.** *Innovative Higher Education.* 2010; **35**(2): 101–111.
Publisher Full Text

Kopnina H, Meijers F: **Education for sustainable development (ESD) Exploring theoretical and practical challenges.** *Int J Sust Higher Ed.* 2014; **15**(2): 188–207.
Publisher Full Text

Kotter J: **Leading Change.** Harvard Business School Press: Boston MA. 1996.
Reference Source

Leal Filho W: **About the role of universities and their contribution to sustainable development.** *High Educ Policy.* 2011; **24**(4): 427–438.
Publisher Full Text

Lozano R, Ceulemans K, Alonso-Almeida M, *et al.*: **A review of commitment and implementation of sustainable development in higher education: results from a worldwide survey.** *J Clean Prod.* 2015; **108**(Part A): 1–18.
Publisher Full Text

Mauser W, Klepper G, Rice M, *et al.*: **Transdisciplinary global change research: the co-creation of knowledge for sustainability.** *Curr Opin Env Sust.* 2013; **5**(3–4): 420–431.
Publisher Full Text

Miller TR, Wiek A, Sarewitz D, *et al.*: **The future of sustainability science: a solutions-oriented research agenda.** *Sustain Sci.* 2014; **9**(2): 239–246.
Publisher Full Text

Müller-Christ G, Sterling S, van Dam-Mieras R, *et al.*: **The role of campus, curriculum, and community in higher education for sustainable development–a conference report.** *J Clean Prod.* 2014; **62**(1): 134–137.
Publisher Full Text

Ndlovu T, Simba A, Mariussen A: **The treacherous path of corporate social responsibility (CSR) and the role of information systems in its implementation**. In: *Corporate Social Responsibility: Concepts, Methodologies, Tools, and Applications.* IGI Global. 2019; 597–619.
Publisher Full Text

Nicolaides A: **The implementation of environmental management towards sustainable universities and education for sustainable development as an ethical imperative.** *Int J Sust Higher Ed.* 2006; **7**(4): 414–424.
Publisher Full Text

Robert KW, Parris T, Leiserowitz A: **What is sustainable development? Goals, indicators, values, and practice.** *Environment Science and Policy for Sustainable Development.* 2005; **47**(3): 8–21.
Publisher Full Text

Ryan A, Tilbury D, Blaze Corcoran P, *et al.*: **Sustainability in higher education in the Asia-Pacific: developments, challenges, and prospects.** *Int J Sust Higher Ed.* 2010; **11**(2): 106–119.
Publisher Full Text

Santillo D: **Reclaiming the definition of sustainability.** *Environ Sci Pollut Res Int.* 2007; **14**(1): 60–66.
PubMed Abstract | **Publisher Full Text**

Smith PA, Sharicz C: **The shift needed for sustainability.** *The Learning Organisation.* 2011; **18**(1): 73–86.
Publisher Full Text

Steffen W, Richardson K, Rockström J, *et al.*: **Planetary boundaries: Guiding human development on a changing planet.** *Science.* 2015; **347**(6223): 1259855.
Publisher Full Text

Swanson D, Frederick W: **Denial and leadership in business ethics education.** *New challenges for business schools and corporate leaders.* 2016; 222–240.

Washington H: **Demystifying sustainability: Towards real solutions.** Routledge: Abingdon. 2015.
Publisher Full Text

Willats J, Erlandsson L, Molthan-Hill P, *et al.*: **A University Wide Approach to Embedding the Sustainable Development Goals in the Curriculum—A Case Study from the Nottingham Trent University's Green Academy**. In: Leal Filho W, ed. *Implementing sustainability in the curriculum of universities: approaches, methods and projects.* Berlin: Springer: 2018; 63–78.
Publisher Full Text

Winter J, Cotton D: **Making the hidden curriculum visible: sustainability literacy in higher education.** *Environ Educ Res.* 2012; **18**(6): 783–796.
Publisher Full Text

Open Peer Review

Current Peer Review Status: ✔ ? ✔

Version 1

Reviewer Report 11 October 2019

https://doi.org/10.21956/emeraldopenres.14077.r26516

✔ **Rosemary Horry**
School of Environmental Science, College of Life and Natural Sciences, University of Derby, Derby, United Kingdom

I thoroughly enjoyed reading the paper and found it very informative and supportive.

There is a statement about illustrated recently and then a reference from 2005, so maybe not that recent.

It would have been useful to have a figure of the mapping of the different strands of the ESD and SD. Also will this be followed up with papers on what happened next? Or where we are in 2019 and how we got here? Think it would be very useful to HEIs. How did you manage the issues of time and resources - it isn't clear from the paper.

You mention that assessment of capacity/latent capacity in 2010 was the key to moving forward - I would have liked more on this or some sort of diagram.

Is the topic of the opinion article discussed accurately in the context of the current literature?
Yes

Are all factual statements correct and adequately supported by citations?
Yes

Are arguments sufficiently supported by evidence from the published literature?
Yes

Are the conclusions drawn balanced and justified on the basis of the presented arguments?
Yes

Is the argument information presented in such a way that it can be understood by a non-

academic audience?
Yes

Does the piece present solutions to actual real world challenges?
Yes

Is real-world evidence provided to support any conclusions made?
Yes

Could any solutions being offered be effectively implemented in practice?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: EMS and ESD.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 15 May 2019

https://doi.org/10.21956/emeraldopenres.14077.r26384

?

Rodrigo Lozano
Utrecht University, Utrecht, Netherlands

Thank you for your paper. I have a number of comments:

- I would have liked to see more details of your findings/results in the abstract. I suggest you remove the last sentence (starting with 'Further recommendations...)
- I find it quite strange that you start with your case study in the introduction, given that much has been written about HESD. I suggest you move the case study to the methods section
- How does NTU compare to, for example, Gloucester university, Leuphana university, etc.?
- Some sentences are rather colloquial, see the last two paragraphs of the introduction
- Do you really need the subheading "Context: general sustainability..." in your literature review?
- I miss more discussion on HESD, at the moment there is only one paragraph. There has been much written about this topic
- The literature review switches too much between SD and ESD, I suggest that the logical flow is revised
- I miss a deeper discussion on HEIs stakeholders
- I suggest that you check the Findler et al.'s paper on HESD impacts

- The Garcia 2006 paper is not referenced correctly, it is Lozano-Garcia
- Page 5, 'To summarise at this point…" I suggest you remove the NTU part and keep it in a general form for HEIs
- I suggest you check the papers on barriers to sustainability too
- As mentioned, I suggest you move the case study to the methods (page 5)
- Page 6, it is my understanding that the HEFCE does not exist anymore, how has this affected NTU?
- There have been many HESD case studies presented, how is the NTU case different from previous ones? How was the data collected? How was it analysed?
- Page 7, if you are looking into barriers to change, you really need to provide theory on change management
- What are the limitations of your method, e.g. validity, reliability, generalisability?
- Since you have a section on SD/ESD in curricula, you really need to have a discussion the integration/incorporation of SD into curricula
- As with the barriers to change, since you are addressing drivers to change, you really need to discuss change management in your literature review
- At the moment, the conclusions are a bit of a summary of the case study, I miss the contribution to 'theory' in this case 'incorporation of SD into HEIs'
- I strongly suggest that the authors frame their research within the organisational change management for sustainability literature. This will improve the paper greatly and move it from its current empirical focus to a more balanced one of theory and practice

References

1. Blanco-Portela N, Benayas J, Pertierra L, Lozano R: Towards the integration of sustainability in Higher Education Institutions: A review of drivers of and barriers to organisational change and their comparison against those found of companies. *Journal of Cleaner Production*. 2017; **166**: 563-578 Publisher Full Text
2. Boks C, Diehl J: Integration of sustainability in regular courses: experiences in industrial design engineering. *Journal of Cleaner Production*. 2006; **14** (9-11): 932-939 Publisher Full Text
3. Bremer M, López-Franco R: Sustainable development: ten years of experience at ITESM's graduate level. *Journal of Cleaner Production*. 2006; **14** (9-11): 952-957 Publisher Full Text
4. Ferrer-Balas D, Buckland H, de Mingo M: Explorations on the University's role in society for sustainable development through a systems transition approach. Case-study of the Technical University of Catalonia (UPC). *Journal of Cleaner Production*. 2009; **17** (12): 1075-1085 Publisher Full Text
5. Findler F, Schönherr N, Lozano R, Reider D, et al.: The impacts of higher education institutions on sustainable development. *International Journal of Sustainability in Higher Education*. 2019; **20** (1): 23-38 Publisher Full Text
6. Findler F, Schönherr N, Lozano R, Stacherl B: Assessing the Impacts of Higher Education Institutions on Sustainable Development—An Analysis of Tools and Indicators. *Sustainability*. 2018; **11** (1). Publisher Full Text
7. Holmberg J, Samuelsson BE: Drivers and Barriers for Implementing Sustainable Development in Higher Education. *Göteborg Workshop. Göteborg: UNESCO*. 2006. Reference Source
8. Kamp L: Engineering education in sustainable development at Delft University of Technology. *Journal of Cleaner Production*. 2006; **14** (9-11): 928-931 Publisher Full Text
9. Kapitulčinová D, AtKisson A, Perdue J, Will M: Towards integrated sustainability in higher

education – Mapping the use of the Accelerator toolset in all dimensions of university practice. *Journal of Cleaner Production*. 2018; **172**: 4367-4382 Publisher Full Text
10. Lozano R: Incorporation and institutionalization of SD into universities: breaking through barriers to change. *Journal of Cleaner Production*. 2006; **14** (9-11): 787-796 Publisher Full Text
11. Lozano R, Ceulemans K, Scarff Seatter C: Teaching organisational change management for sustainability: designing and delivering a course at the University of Leeds to better prepare future sustainability change agents. *Journal of Cleaner Production*. 2015; **106**: 205-215 Publisher Full Text
12. Stough T, Ceulemans K, Lambrechts W, Cappuyns V: Assessing sustainability in higher education curricula: A critical reflection on validity issues. *Journal of Cleaner Production*. 2018; **172**: 4456-4466 Publisher Full Text
13. Velazquez L, Munguia N, Platt A, Taddei J: Sustainable university: what can be the matter?. *Journal of Cleaner Production*. 2006; **14** (9-11): 810-819 Publisher Full Text

Is the topic of the opinion article discussed accurately in the context of the current literature?
Partly

Are all factual statements correct and adequately supported by citations?
Partly

Are arguments sufficiently supported by evidence from the published literature?
No

Are the conclusions drawn balanced and justified on the basis of the presented arguments?
Partly

Is the argument information presented in such a way that it can be understood by a non-academic audience?
Partly

Does the piece present solutions to actual real world challenges?
Partly

Is real-world evidence provided to support any conclusions made?
Partly

Could any solutions being offered be effectively implemented in practice?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: change management, organisational sustainability, higher education for sustainable development

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have

significant reservations, as outlined above.

Reviewer Report 18 April 2019

https://doi.org/10.21956/emeraldopenres.14077.r26357

Maria Nita
Department of Theology and Religion, University of Birmingham, Birmingham, United Kingdom

This is an excellent article, engaging with an urgent topic, namely the integration of education for sustainable development (ESD) into higher education. The authors take an original approach by reflecting on their own journey of achieving the integration of ESD into the core curriculum at Nottingham Trent University (NTU). The article offers a case study of the implementation of ESD and discusses key activities that contributed to this, such as undertaking a review and administering an institution-wide survey. The article has implications for future policy and the recommendations given in the final section make the article a key resource for future developments in this area. It would be interesting if the authors could assess the future impact of their article and the model they proposed, in other HE institutions.

Is the topic of the opinion article discussed accurately in the context of the current literature?
Yes

Are all factual statements correct and adequately supported by citations?
Yes

Are arguments sufficiently supported by evidence from the published literature?
Yes

Are the conclusions drawn balanced and justified on the basis of the presented arguments?
Yes

Is the argument information presented in such a way that it can be understood by a non-academic audience?
Yes

Does the piece present solutions to actual real world challenges?
Yes

Is real-world evidence provided to support any conclusions made?
Yes

Could any solutions being offered be effectively implemented in practice?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Interdisciplinary scholarship concerned with environmental values, sustainability, and education. Other interests include: religious discourses, performance and festivals.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.