

Universities as the engine of transformational sustainability toward delivering the sustainable development goals

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“Living labs” for sustainability

Wendy Maria Purcell

Department of Environmental Health, Harvard T.H. Chan School of Public Health, Harvard School of Public Health, Boston, Massachusetts, USA

Heather Henriksen

Office for Sustainability, Harvard University, Cambridge, Massachusetts, USA, and

John D. Spengler

Harvard T.H. Chan School of Public Health, Harvard University, Cambridge, Massachusetts, USA

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Abstract

Purpose – Universities can do more to deliver against the sustainable development goals (SDGs), working with faculty, staff and students, as well as their wider stakeholder community and alumni body. They play a critical role in helping shape new ways for the world, educating global citizens and delivering knowledge and innovation into society. Universities can be engines of societal transformation. Using a multiple case study approach, this study aims to explore different ways of strategizing sustainability toward delivering the SDGs are explored in a university setting with an example from the UK, Bulgaria (Europe) and USA.

Design/methodology/approach – The first case is a public UK university that adopted enterprise and sustainability as its academic mission to secure differentiation in a disrupted and increasingly marketized global higher education sector; this became a source of inspiration for change in regional businesses and the local community. The second case is a business sector-led sustainability-driven transformation working with a private university in Bulgaria to catalyze economic regeneration and social innovation. Finally, a case from

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the office for sustainability in a major US research university is given to show how its engagement program connected faculty and students in sustainability projects within the institution and with external partners.

Findings – Each case is in effect a “living lab,” positioning sustainability as an intentional and aspirational strategy with sustainable development and the SDG framework a means to that end. Leadership at all levels, and by students, was key to success in acting with a shared purpose. Partnerships within and with universities can help accelerate delivery of the SDGs, enabling higher education to make a fuller contribution to sustaining the economic, environmental, cultural and intellectual well-being of our global communities.

Originality/value – The role of universities as the engine of transformational sustainability toward delivering the SDGs has been explored by way of three case studies that highlight different means toward that end. The collegiate nature of the higher education sector, with its shared governance models and different constituencies and performance drivers, means that sustainability at a strategic level must be led with leaders at all levels acting with purpose. The “living lab” model can become a part of transformative institutional change that draws on both top-down and bottom-up strategies in pursuit of sustainable development.

Keywords Sustainability, Living labs, Sustainable development goals, Change and transformation, University and higher education

Paper type Case study

1. Introduction

We face global environmental, social and economic challenges, approaching a tipping point that threatens to overstep our planetary boundaries. In 2015, 193 countries came together to define and adopt the sustainable development goals (SDGs) – the first agreed actionable agenda by the global community for all citizens comprising a suite of objectives and targets for worldwide sustainable development by the year 2030 to end poverty, protect the planet and ensure that all people enjoy peace and prosperity (United Nations General Assembly, 2015). With higher education institutions being locally rooted and globally connected, they offer significant opportunities to deliver against the SDGs, working with faculty, staff and students, as well as their wider stakeholder community and alumni body (Findler *et al.*, 2019; Trencher *et al.*, 2014; Cortese, 2003). As Jeff Sachs (Director, UN Sustainable Development Solutions Network) said “Advancing the SDGs is the ‘moon shot’ for our generation.” (Sachs, 2018). Sustainability is a goal for today, with the SDGs a compass in a world defined by volatile, uncertain, complex and ambiguous (VUCA) conditions, and universities have a critical role to play as change agents.

Higher education can help shape new ways for the world, tackling the grand challenges of our day as reflected in the SDGs (United Nations General Assembly, 2015; Trencher *et al.*, 2014). Being at the forefront of scientific and technological advances in undertaking global research and educating future leaders and professionals, universities deliver impactful knowledge in every sector across all nations and act as anchors in the communities they serve nationally and internationally. Universities can help facilitate change toward a more equitable society and a better world by adopting the SDGs at a strategic level in pursuit of sustainability and as a means of connecting higher education with business, industry, healthcare, community partners and entrepreneurs (Findler *et al.*, 2019; Stephen *et al.*, 2008). However, sustainability often sits on the margins of mainstream subjects, with academic work in the field largely separate from campus operations and community service such that universities struggle to integrate sustainability into their governance and business models (Evans *et al.*, 2015). It is here that the present study offers insights into approaches a university might adopt in pursuit of delivery toward the SDGs given that a more transformative approach is needed to connect the university community across the institution, as well as with the external communities it serves and interacts with locally, nationally and internationally. Focusing deliberately and proactively on the SDGs, change

within the university and *with* external partners can help deliver a more sustainable and inclusive future. Here, the radical adaptive changes needed to deliver institutional transformation aligned with the SDGs were explored in different settings using a multiple case study approach.

We have been deliberate in the use of some key terms: “sustainability” is used to describe the overall strategic aspiration, shared purpose or mission of the transformation, while “sustainable development,” as represented by the SDG framework, we take to refer to the means of achieving that strategic mission. We have not taken each of the SDG goals or targets individually, rather the SDGs are used as a collective world strategy against which universities are but one actor in the ecosystem of change. A “living lab” is defined as a situation or circumstance where real-world sustainability challenges are formally addressed in stakeholder partnerships (König and Evans, 2013), a form of experimental governance (Evans *et al.*, 2015); framed in this way, each of the case studies examined is in effect a “living lab.” While the concept has been adapted over the years, there is renewed interest in living labs as a sustainability-oriented cross-cutting approach to the SDGs in higher education and research (Waheed, 2017; Evans *et al.*, 2015; Trencher *et al.*, 2014).

Drawing on examples of different ways of strategizing this agenda in a university setting, an example is given from each of the UK, Bulgaria (Europe) and USA. The first, a UK university undergoing pan-institutional to redefine its academic priorities around enterprise and sustainability to differentiate it in an increasingly marketized and disrupted global higher education sector (Purcell *et al.*, 2016); this mission-led change went on to catalyze and accelerate change in business, civic and community settings in the wider region (Purcell *et al.*, 2017). The second, a university in Bulgaria (Europe) working to co-create transformational change programs with a business-sector association to help create sustainability leaders to support sustainable development by business. The final case draws out how a research-intensive Ivy League USA university is leading change through its professional sustainability services, activating students and faculty around shared purpose and creating connections with external companies and civic partners relevant to the university’s mission.

Projects that draw upon the university’s own assets, across its academic *and* operational domains, to tackle sustainable development challenges can draw upon the human capital and resource infrastructure of the institution itself in the manner of a “living lab.” Offering real-world learning and research opportunities for students and faculty, the university itself can become a test bed for SDG solutions (Brundiers and Wiek, 2011). In this way, pedagogic innovation and research opportunities emerge, focused on stakeholder priorities but aligned with the academic mission of the institution (Rosenberg Daneri *et al.*, 2015). Professional, administrative and executive staff can engage with faculty and students, tackling campus challenges as well as strategic projects including those within the academic domain (Budwig, 2015; Evans *et al.*, 2015). Reaching out to develop living labs with external organizations, such as local government or business, can connect a university with a wider stakeholder group and help drive local innovation or create community-level projects (Rosenberg Daneri *et al.*, 2015). A “living lab” model can therefore function as a convening framework supporting formal intra- and inter-organizational governance (Waheed, 2017). The solutions emerging from living labs can deliver social, economic and/or environmental benefits to the university itself, to its wider community and potentially society at large thereby accelerating progress toward delivering the SDGs.

Given the pluralistic nature and competing goals of a university, being a professional organization largely run by faculty who are scholastic, management needs to be by persuasion with leadership effected through the articulation of a compelling change

narrative (Purcell *et al.*, 2017; Rosenberg Daneri *et al.*, 2015). Placing sustainability as a central strategic agenda, can connect the different constituencies within the university and with others outside the university to progress achievement of the SDGs with networks convened around shared purpose. Here, each case study seeks to identify the route taken to strategize sustainability as the aspiration, with sustainable development as represented by the SDGs being how we get there. Common themes and leadership insights of interest to those involved in re-framing sustainability as a transformational agenda *within* a university or in partnership *with* a university have been identified.

2. Materials and methods

A multiple case study approach (Stake, 2013; Eisenhardt, 1989) was adopted given its usefulness in obtaining an in-depth appreciation of an issue or area of interest in its natural real-life context. While comparison among universities is difficult, using the mission as a parameter is an established approach (Purcell *et al.*, 2016). Different ways of strategizing sustainability as the overall aim, with the SDGs being the means to that end, were examined in a university setting experienced first-hand and over time by one or more of the authors with the lead author connected to each case: in the UK (Plymouth University [PU] by WP); in mainland Europe (American University in Bulgaria [AUBG] by WP and JS); and in the USA (Harvard University [HU] by HH and JS). The review of each case was undertaken in 2018 with a different timeframe for each case as follows: PU 2007-2015; HU 2010-2018; and AUBG 2017-2018. The case study approach was selected as it allowed the dynamics of each situation to be explored, with multiple levels of enquiry undertaken within a single study. Through the examination of archival materials (PU), interviews (PU, AUBG), visits (AUBG, HU), observations (PU, AUBG, HU) and experience (PU, AUBG, HU), key insights in each case have been drawn out to identify any common patterns and/or relationships across the cases; the lead author provides a connectivity across each of the three cases offering oversight in arriving at a common view of the observations. It is not an intention of the account to advertise the universities concerned, rather, each of the three cases has been selected to illustrate the journey toward sustainability, at a strategic level, using the SDG framework to support actions that move toward delivering sustainable development. Each case is different in terms of scale, whether pan-institutional (PU), a collaborative project with external partners (AUBG) or driven centrally by a professional services unit working with students and faculty (HU). Common themes emerging across various dimensions from each instrumental case study have been determined, noting that PU is a retrospective change program (2008-2015), AUBG is a relatively new change initiative (2017-date) and HU a mature one (2010-date).

In assembling these cases, key insights into the “living lab” model in action were sought in pursuit of securing a better understanding of the actuality, and thus the potential, of universities to accelerate delivery of the SDGs. Key features of the transformation, from the perspective of leadership and governance, together with examples of key outcomes are given to illustrate the far-reaching impact of placing sustainability center stage in strategy, rather than being merely a compliance or regulatory agenda. Others have reported comprehensively (Ferrer-Balas *et al.*, 2008; Lozano, 2006; Wright, 2002) on key barriers and drivers of a “sustainable university”; this is not repeated here. However, where appropriate, insights relevant to enabling leaders deliver change through the adoption of a strategic approach to sustainability are drawn to enable those planning, or amid, delivery toward the SDGs within a university setting and/or with external partners.

3. Results

Each of three “living lab” case studies are described, highlighting key benefits realized and leadership and governance insights relevant to change and transformation in adopting strategic sustainability as an aspirational agenda for transformation secured by change projects delivering toward the SDGs. The framework adopted to review these cases relates to our conceptual model of how the senior management hierarchy (SMH; the bounded executive command-control system) interacts with the more agile unbounded community of social networks (CSN; groups that convene around shared purpose projects, including standing committees, task and finish groups and informal assemblies) (Purcell *et al.*, 2017).

3.1 Plymouth University (PU)

During the time period under review (2007-2015) PU was a large (30,000 students) public university, based in the far South West region of England, UK in an area of high socio-economic deprivation. It achieved university status in 1992 and, as a former polytechnic institution, its focus was to prioritize social inclusion, pedagogic innovation and vocational education (medicine, law, engineering, health, etc.) alongside applied research in key areas closely linked to business and the professions. At the time of its transformation under a new president vice-chancellor (2007-2015), the UK sector was undergoing significant national policy-led changes with a shift in public funding from government grants to per-capita student fees. This marketized approach was a source of substantial disruption in the sector, with institutions responding by seeking to differentiate their academic offer (Purcell *et al.*, 2016). PU adopted a mission-led transformation based on the concept of enterprise and sustainability as key to institutional health over the long term, committing to transforming lives through education and research. Sustainability was adopted at a strategic level in 2008 and was used as a lens through which the university’s teaching, research, operations and community service were viewed (Purcell *et al.*, 2017); latterly, we can consider PU’s broad-based sustainability agenda aligned with the SDGs ratified in 2015.

PU’s distinctive mission sought to draw upon the talents, aspirations and indeed dreams of the university’s faculty, staff, students and wider stakeholders. As such, purposeful leadership and governance process and practices were in play to secure engagement and innovation to effect sustained change and regeneration (Whelan and Fink, 2016), with the SMH ostensibly “activating” the CSN around shared purpose projects. Review of archival materials available in the public domain showed success indicators were multi-faceted. For example, up to 2015, PU remained the overall sector leader in the People and Planet Green League, based on rankings since the league table began in 2007. PU’s “green” agenda was based on a strong track record over many decades of world-leading sustainability research and the work of its Center for Sustainable Futures in education for sustainable development (ESD). This positioning was strengthened at a strategic level by the establishment in 2012 of an Institute for Sustainable Solutions Research that reflected the spectrum of sustainability across the university, from environmental and human impacts through to ESD and the humanities. PU faculty developed the national Higher Education Academy’s guide to teaching and learning for sustainability in higher education, “The Future Fit Framework,” and the seminal work “The Sustainable University” (Stirling *et al.*, 2013). The university’s success in adopting an integrated approach was demonstrated in 2010 when it received ISO14001 accreditation for its environmental management systems, recognizing its systematic approach to controlling environmental impacts. In 2012, PU was awarded the prestigious Queen’s Anniversary Prize for its work in marine renewables research and ESD; these prize awards are biennially awarded to only a handful of higher education institutions within the United Kingdom as part of the British honors system. In 2015, PU went on to

receive the National Union of Students “Responsible Futures” accreditation, a student-led scheme that seeks to identify universities driving delivery toward SDG4 goal 4.7, that is “By 2030 ensure all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture’s contribution to sustainable development.” (United Nations General Assembly, 2015). Other initiatives arising from the university’s strategic sustainability agenda were delivered in partnership with its stakeholders. For example, working with the business-led City Centre Development Company, a regional environmental charity, and the retailers Marks and Spencer plc to transform a piece of vacant land it created “The Jigsaw Garden” as a community green space. PU also led the restoration of Drake’s Place Reservoir and Gardens, a space in the heart of the city with some 0.9 ha of green space and a 17,000 m³ reservoir, transformed into a venue for community leisure, learning and volunteering projects; the project won an Abercrombie Sustainable Design Award in 2014 and a Green Flag Award from Keep Britain Tidy.

PU was deliberate in its approach to promoting, embedding and delivering on its new mission and overall strategic direction toward sustainable development. A Change Academy team of 8-10 people was established by the SMH with members drawn from the different university communities across the CSN, representing executive, faculty and professional staff. The initial Change Academy project was competitively-sponsored by the National Leadership Foundation and the Higher Education Academy over an academic year (2008), to support teams’ plan and deliver pan-institutional change initiatives. This was supplemented by a university-wide team of volunteer Enablers, some 50-60 people drawn from the CSN and representing all constituencies. Enablers were trained by the university’s Human Resources team and senior managers to support change and provide peer-to-peer support for innovation. The SMH and CSN worked in concert around the shared purpose of the mission in pursuit of the SDGs. The Change Academy and Enabler network also included students as partners (rather than customers), ensuring their dynamic participation in their own learning journey as active global citizens fully aware of the need to build and maintain a sustainable society; many projects to enhance the student experience emerged but these are not included here.

The transformation of PU as a public institution became a source of inspiration for the transformation of the local community and wider region in the manner of an “anchor” institution (namely, an institution rooted in its local community by mission, invested capital and relationships to students, employees and vendors that controls vast economic, human, intellectual and institutional resources with the potential to bring crucial, and measurable, benefits to the city-region; Purcell *et al.*, 2016). Several initiatives at PU revealed the way in which it was focused on developing the needs of its stakeholders where they aligned with delivering the academic mission of the university, offering jobs, placements, research, consultancy and projects for students, faculty and staff. For example, the university established the Growth Acceleration and Innovation Network (GAIN) as a regional innovation ecosystem with the City Council bringing \$150m worth of innovation assets (regional science park, incubation and innovation centers) under one governance entity. GAIN was used as a vehicle to secure economic development funds from the European Union and national government, bringing in some \$40m and leveraging additional private monies to support sustainable economic growth in the region; around 1,500 jobs were created and \$70m of private sector co-investment secured. Another example relates to promoting sustainable procurement, where PU led the consortium of civic and business

actors to set up Sell-to-Plymouth (S2P) in 2009, targeting small- and medium-sized enterprises to drive up their success in securing public sector contracts; the project won the Times Higher Education Leadership and Management Award for sustainable procurement. In community health, the university's clinical dental training was set up as a social enterprise to deliver dental services to 16,000 patients in some of the city and region's most deprived neighborhoods. The university itself went on to champion social enterprise, leading the national University Enterprise Network for Social Enterprise and becoming the first higher education institution to be awarded the social enterprise mark. Overall, pursuit of sustainability (which to all intents and purposes we can view here as aligned with the SDGs) appeared to catalyze the university community in pursuit of shared actions, activating students and the wider civic and business communities.

3.2 American University in Bulgaria (AUBG)

AUBG is a small (1,000 students) private university based in Bulgaria (Sofia and Blagoevgrad) in an area of relatively high socio-economic indices. Established in 1991, in the manner of a liberal arts institution with programs accredited by US and EU bodies and delivered in English, its focus is on preparing democratic and ethical leaders. Approached in 2017 by the Bulgaria Soft Drinks Association (BSDA; set up in 1996 and now representing the interests of 70 per cent of the sector, including bottled water) AUBG embarked on developing a bespoke Sustainability and Leadership and Innovation Program (SLIP) for C-suite executives and senior staff in member companies. Relevant here is that AUBG was not previously engaged with the SDGs in a deliberate manner, albeit some of their programs addressed sustainability topics. Rather, it was the catalyst of being approached by BSDA that caused the university to adopt a more strategic approach in this domain, reaching out to experts as partners to co-create a program. AUBG secured academic advice from Harvard University faculty and international academic advisers in developing the program to re-frame sustainability as a strategic agenda, aligning business goals with the SDG framework. The CEO's of Coca-Cola HBC and Devin Water were key stakeholders in co-development of the transformational leadership program and highlighted the importance and inherent tensions of competing for sustainable growth while meeting the needs of customers and society (Nidumolu *et al.*, 2009).

This real-world sustainability challenge of "good growth" and the SDGs (Ferrer-Balas *et al.*, 2008) is being formally addressed in a stakeholder partnership of businesses with a university, creating a "living lab" in which to explore creative solutions. Key was AUBG's experience with senior professionals undertaking MBAs and similar programs, together with the experience of its external academic advisers with deep knowledge and experience of whole organizational change and sustainability for business value creation, promoting societal impact and environmental protection and restoration. While the first cohort of senior leaders has just completed the program, it was piloted in 2018 with CEO members of the BSDA. Qualitative data on impact revealed that prior to the program sustainability was framed as a compliance/ regulatory agenda and part of being a good corporate citizen (Wright, 2002) but was not positioned at a strategic systems-level in business strategy. While aware of the SDGs, the goals were not lined up against business performance indicators or corporate social responsibility projects. One CEO reflected during a post-event feedback session that he/she had never thought of human capital and talent as being related to sustainable development but having now seen sustainability reframed at a strategic level saw its immense value to long-term business success. Similar comments related to community projects, currently under the banner of corporate social responsibility, that are now being considered as part of a corporate social innovation agenda.

Although it is too early to comment on the successes of the individual change projects underway by the first cohort, a review of their Statement of Work reports reveals wide-ranging sustainability projects rooted in securing behavioral change to drive efficiency and effectiveness within their host companies. Each of the planned projects has used the SDGs as a framework to narrate the change plans, connecting local action to global impact. Key to creating the overall program, was the shared governance space offered by BSDA, which as a member organization was one remove from day-to-day business challenges and thus able to garner learning needs from its members and collate these into a sector-led vision for the future. The engagement of the CEOs directly with members of their SMH was essential to developing a transformational agenda for change. This deliberate process, framed by the SDGs, meant that BSDA did not seek a simple business-consultancy solution for its members, rather it moved to set up an academic partnership with a university and international academic advisers to design a learning journey to change people and through them the businesses concerned and the communities they are situated within and operate from.

3.3 Harvard University (HU)

HU is a mid-size (22,000 students) private Ivy League research university based on the east coast of the US clustered around Boston and Cambridge in the state of Massachusetts, in an area of high socio-economic indices. It was established in 1636 and is global in its reach and impact. Its 12 degree-granting schools are largely independent with the President and Fellows of Harvard College as one of two governing boards (The Corporation; the other, the Board of Overseers). Professional services are typically pan-university departments, such as campus services where the office for sustainability (OFS) leads the creation of a healthier and more sustainable campus community. HU's sustainability plan aligns the university's decentralized campus around a holistic vision and sets clear university-wide goals across a range of priorities from emissions and energy, campus operations, nature and ecosystems, health and well-being, and culture and learning. Key to delivering its role, is the way in which OFS works to encourage students, faculty and staff to experiment with sustainability solutions in the manner of a "living lab," using HU's cutting-edge research and teaching to tackle real-world SDG challenges on campus as well as in community settings at home and overseas.

OFS supports innovation to address problems threatening the health of people and planet, as captured by the SDGs, working on-the-ground and across disciplines, co-funding projects through its Campus Sustainability Innovation Fund and Green Revolving Fund, and acting as a convener and connector as well as adviser, trainer, mentor and coach to those involved in shared projects. Using its convening power, OFS is institutionalizing change by empowering people to make informed choices. For example, its Healthier Building Materials Academy brings the OFS and the university's capital project management teams together with faculty and students to bring about change, demanding transparency and holding vendors accountable. Together with the Harvard T.H. Chan School of Public Health, Harvard Medical School, Harvard John A. Paulson School of Engineering and Applied Sciences and Google, OFS is at the center of a national movement to reduce harmful chemicals in building products and materials used in construction and renovation, developing public tools and resources based on science to inform evidence-based decision-making. Working directly with faculty, OFS helped to create a trans-disciplinary climate change learning course by creating a space for students from across the university to come together with faculty in hands-on research to investigate solutions to real-world sustainability challenges. OFS also engages with civic organizations, for example through

the Boston Green Ribbon Commission, a group of business, institutional and civic leaders working to develop shared strategies for fighting climate change, supporting the Higher Education Working Group to bring the expertise of the sector to the work of the Commission in pursuit of delivery toward the SDGs.

Key to its success, OFS acts as a trusted professional resource for the university and its wider stakeholders. But its reach and impact are amplified through the “living lab” model which creates a shared governance space into which faculty, students and staff from across the university’s schools and departments can convene around shared purpose; OFS serves to “activate” the CSN and SMH. Presenting real-world questions to those involved in creating solutions through research and innovation is mutually beneficial and reinforcing with live challenges addressed in real-time. The OFS is central to evidence-based outcomes and sustainable development is strategized through the pan-university sustainability plan and delivered in a tricameral partnership – the OFS, the university and the communities the university serves, locally and globally.

3.4 Emergent cross-case themes

From the three case studies, there is no one-size fits all approach or blueprint to follow to bring universities and the SDGs closer together (Table I), rather there are a range of means that can be adopted to position sustainability as a strategic agenda in support of delivery toward the SDGs. What does however hold the cases together is the role that senior leaders in the SMH played in each case, positioning sustainability and/or the SDGs as a framework against which their organizational mission can be aligned. This visibility was a powerful activator of the CSN, drawing people together around shared projects which relate to the global movement represented by the SDGs (United Nations General Assembly, 2015). Also apparent in each case was the co-creation of impactful projects developed by drawing

Characteristics and insights of the university ^a SDG agenda	PU (UK)	AUBG (Europe)	HU (USA)
Research-intensive university	X	X	✓
Teaching and research university	✓	X	X
Teaching-priority university	X	✓	X
Led by senior management with faculty and staff	✓	X	X
Led by staff, with faculty and senior management	X	X	✓
Led by external stakeholders, with senior management	X	✓	X
Led by students	X	X	X
Influenced teaching and learning strategy	✓	✓	✓
Influenced research and innovation strategy	✓	X	✓
Yielded new sources of income	✓	✓	✓
Yielded reputational gain	✓	✓	✓
Mission-focused transformation	✓	X	X
Purpose-driven transformation (internal/external)	✓	✓	✓
Used “living labs” framework	✓	X	✓
Evidence of capacity and capability building of human capital	✓	✓	✓
Evidence of interdisciplinarity as enabler	✓	✓	✓
Evidence of wider stakeholder impact/benefits	✓	✓	✓
Evidence of context-related articulation of the SDGs	✓	✓	✓

Note: ^aSDG agenda is taken to include PU’s broader sustainability agenda that pre-dated the United Nations ratification of the goals in 2015

Table I. Comparison of three cases studies: universities pursuing the SDGs

different actors together around shared purpose, with the SDGs acting as a strong convening force connecting institutional projects with wider global goals. It was clear that the co-creation required to effect delivery against the SDGs was supported by the shared governance space offered by the “living lab” model. Given the context, a notable theme was the way students were activated by engagement with the SDGs, supporting the development of their leadership practice and exploring inter-disciplinary approaches to find solutions to global issues.

The “why” of pursuing sustainability was however quite different, from an institution seeking to differentiate itself in a crowded global market to another moving to connect its professional operational focus and expertise with faculty and students in pursuit of shared delivery and finally a university moved to act upon client demand channeled through its business sector association. Whatever the driver, the shared narrative of the SDGs can offer a useful framework to connect a range of different projects with an agenda for change that has the potential to be transformational.

4. Discussion

Universities operate in a global market with increasing pressure to attract students, undertake world-class research and be impactful through innovation and their work in communities, as well as meeting the rising expectations of students and other key stakeholders demanding quality, value and a lifelong return on investment (Purcell *et al.*, 2016). Using a multiple case study approach to examine three different sustainability-led transformations in a university setting, key features of the change process together with illustrative outcomes were explored to secure insights relevant to leaders effecting change as a route to sustainable development and delivery toward the SDGs (United Nations General Assembly, 2015). The conceptual leadership and governance framework (Purcell *et al.*, 2017) was used to draw out common themes and relationships among the cases as these universities move beyond the so-called “third mission,” where teaching and research are taken as the first and second missions with any applied works in either sphere considered “other” or third (Trencher *et al.*, 2014; König and Evans, 2013). While comparison among universities is difficult, using the mission as a parameter is an established approach (Purcell *et al.*, 2016).

It was clear that the strategic sustainability in pursuit of the SDGs needs to be led, placing critical emphasis on the role of leaders at all levels and particularly the ways in which the SMH engages with and activates the CSN (Purcell *et al.*, 2017); this was a key finding in each case. This may be mission-led, as in PU, business-led, as in the AUBG case, or service-led as illustrated by the HU case. Given that most campuses function as microcosms of society, with housing, transport, food outlets, health services and so on, they can easily become a test bed for exploring SDG solutions. This serves to connect the university with the society it serves, locally and globally. High-impact tangible outcomes emerged in these cases, each a “living lab,” producing benefits for faculty and student scholarship, as well as a more connected university community (Rosenberg Daneri *et al.*, 2015; Trencher *et al.*, 2014; Stirling *et al.*, 2013).

The key aspects of transformation of universities toward sustainability, in considering the “sustainable university” have been described in detail (Ferrer-Balas *et al.*, 2008) noting barriers and drivers of change from academic freedom to external pressures. As illustrated by the PU case, the role of champions (“enablers”) was determined to be a key characteristic (Ferrer-Balas *et al.*, 2008). With AUBG, the role of external stakeholders was central to the

transformation, a position noted previously (Lozano, 2006). With HU, we are not aware of another example whereby a central university professional service department has led a pan-institutional agenda related to the SDGs; this is to be commended given the expertise and assembling power the central team has available to support strategic sustainability at the whole institutional level.

With PU, even though the university's mission-led transformation was an act of self-preservation in response to widespread disruption in the higher education sector, its tricameral approach to strategic sustainability created value across economic, social and environmental dimensions. The role of visionary leadership (Trencher *et al.*, 2014; Ferrer-Balas *et al.*, 2008) and stakeholder engagement (Rosenberg Daneri *et al.*, 2015; Lozano, 2006) meant that the university community became hyperaware of wider global trends, enabling it to react with agility to emerging change in pursuit of the sustainability (Purcell *et al.*, 2017; Evans *et al.*, 2015; Stirling *et al.*, 2013). A strong institutional culture was key, that is, the way people talked about, acted upon and indeed thought about sustainability and enterprise while at work and in their private lives. This relied upon a peer network of so-called Enablers working with people as they translated the institutional change mission into a personal change journey as a critical part of the work of the CSN (Purcell *et al.*, 2017). The transformation of the local university became a source of inspiration for the transformation of the local community, which contributed to the sustainability of the university and its wider community in the manner of circularity. For example, raising awareness of the university's offerings by community outreach and engagement activities drew people into the university to seek advice, commission consultancy and research as well as undertake courses and programs and become philanthropic donors. PU became more entrepreneurial and sustainable, able to thrive in a VUCA environment and sustain a competitive position in a dynamic policy landscape and global sector.

With AUBG, the demands of the client (as represented by BSDA) created an opportunity to develop new academic networks and programs and brought the university into closer dialogue with major local employers gaining an insight from BSDA's CEO members into future-facing challenges relevant to the university's mission to develop ethical leaders. The BSDA members are connectors with society (Ferrer-Balas *et al.*, 2008) who are being exposed through the new program not to just-in-time fixes for immediate business problems, but to a personal and professional transformational learning experience setting up C-suite executives and senior staff to lead in situations characterized by ambiguity and disruption. Re-framing sustainability as a solution rather than another problem is key to unleashing innovation and challenging leaders to function at a systems-level rather than in operational silos (Nidumolu *et al.*, 2009).

With HU, the OFS acts as a connector (Ferrer-Balas *et al.*, 2008) drawing the CSN of talented faculty, students and staff around shared purpose – the university's sustainability plan – but using the language that excites them of research, teaching, discovery, innovation and learning to communicate co-creation using a "living lab" model (König and Evans, 2013). Participants work across disciplinary and theory/practice gaps addressing "real-world" projects of local/global benefit, driving up student engagement and employability as well as research funding and impact. The OFS also acts as a convener, bringing together examples of "living lab" projects and making these more visible and impactful at the institutional level serving to showcase its work relevant to the SDGs. This interdisciplinary driver of change has been recognized (Ferrer-Balas *et al.*, 2008) and is a pattern emerging from this study.

The convening power of universities can be harnessed to bring together a range of actors in a “neutral” space, as per the “living lab” model described here, reflecting the interdependence of teaching and research and the societal importance of higher education. Participants from different areas within the university and with external people and organizations can come together to collectively address real-world sustainability issues. The “living lab” is a dynamic network, combining an institution’s intellectual and other resources with practical sustainability challenges on- or off-campus. It effectively dissolves boundaries between the traditionally segregated activities of education, research, external engagement, operational and administrative practice (Evans *et al.*, 2015).

Common themes among the different case studies were identified. Central was that of shared purpose as represented by sustainability and/or the SDGs (United Nations General Assembly, 2015). A move by a university toward strategic sustainability can present a major challenge for university leaders, with tensions arising, for example, between institutional goals, cultural preferences, and individual and organizational drivers; these tensions can have a knock-on effect on resources and effort. Perhaps the greatest challenge for leadership is to foster an innovative approach throughout the organization, and thereby potentially be perceived as a challenge to the rightful academic independence of departments. This requires sustainability to move center stage to inform the strategic mission of the university to accelerate change and co-create the future. A transformation of this magnitude requires time for the community to do its work at the individual, group and community levels in terms of socializing the change and this is probably one of the biggest challenges to face when, along with leadership of the transformation itself, short-term results are required. Each community, like everyone, has its own amount of time required for its transformation, depending on its level of development, and so leadership of these processes requires very specific capabilities to manage the frustration, fear, uncertainty and loneliness that can arise throughout the entire transformational process. It is here that the SMH and CSN (Purcell *et al.*, 2017) working in harmony can deliver against the strategic agenda of the SDGs.

Other common themes were collaboration and transdisciplinary approaches. Real sustainability challenges do not respect disciplinary boundaries or theoretical models, and therefore cannot be effectively addressed through these narrow lenses (Budwig, 2015; Brundiens and Wiek, 2011). This is highly relevant to the SDGs given pollution and poverty do not respect geography. Collaboration is central to the co-creation process inherent in a “living lab” study, enabling a constant cycle of experimentation, prototyping and testing. Systems thinking by leaders also characterized the approach needed to bring sustainability center stage, understanding the interdependence and inter-connectedness within their organization, as well as to global society and the natural world.

The collegiate nature of the university sector with its shared governance models and different constituencies and performance drivers, means that sustainability at a strategic level must be led (Waheed, 2017; Purcell *et al.*, 2017; Trencher *et al.*, 2014), with leaders at all levels acting with purpose. Leadership is needed to harness the social forces and inspire people to take actions around a shared vision of the future. The change needs to be anchored in the culture, reminding us that cultural change comes at the end of a transformation and not the beginning. The “living lab” framework can become a part of transformative institutional change that draws on both top-down and bottom-up strategies. Recognizing leadership from students and stakeholders was also important, as they bring their unique and diverse perspectives to sustainable development projects (Trencher *et al.*, 2015).

This study is limited in scope to three cases and the authors recognize their own role as leaders and researchers brings its own biases. While each is an exemplar of a distinctive strategy adopted in pursuit of delivery toward sustainability and/or the SDGs, they cannot capture the richness and depth of interactions between a university or college and society at large in pursuit of sustainable development (Findler *et al.*, 2019; Evans *et al.*, 2015; Rosenberg Daneri *et al.*, 2015; Trencher *et al.*, 2014; Lozano, 2006). With PU's whole institutional strategy able to "touch" every aspect of the university's academic and professional activities, the approach became so embedded over the eight years since it launched that its impact as a change initiative was lost such that innovation resources were slowly withdrawn. Perhaps a marker of success, but a risk factor to deepening the strategic impact of the mission. With AUBG, it is simply too soon to measure the impact of a targeted professional executive development program on driving behavior to delivery against the SDGs. While the program has already survived the transition to a new CEO in one of the lead companies, there is of course a danger that the projects launched under the program will not deliver enough business value through sustainability to be continued. With HU, the OFS continues to innovate and co-create projects with students and faculty in a well-resourced and research-intensive environment. Careful attention to determining impact and outcomes as well as a robust communication strategy look set to support HU's efforts in this regard.

Overall, key to university engagement with the SDGs was the strategic alignment of the academic mission with sustainable development in its broadest definition (Rouxle and Pretorius, 2016). An effective means of framing this was to adopt a "living lab" model that can bring a range of projects under one governance framework. This model also brings the on-campus professional sustainability team into closer dialogue with faculty and students to tackle real-world problems through experiential teaching and learning and/or research and development projects whether conducted within the university or with external partners (Clifford and Petrescu, 2012). The potential of higher education to deliver against the SDG 2030 agenda is profound (Findler *et al.*, 2019; Sachs, 2018) and, as the university becomes more connected to the society it serves, the journey to sustainable development can be accelerated (Cortese, 2003). Partnerships *within* and *with* universities can help higher education making a fuller contribution to sustaining the economic, environmental, cultural and intellectual well-being of our global communities (Lozano, 2018).

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Corresponding author

Wendy Maria Purcell can be contacted at: wpurcell@hsph.harvard.edu