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Knowledge-driven actions: Transforming higher education for global sustainability

Independent Expert Group on the Universities and the 2030 Agenda

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United Nations
Educational, Scientific
and Cultural Organization

Education 2030

Published in 2022 by the United Nations Educational, Scientific and Cultural Organization,

7, Place de Fontenoy, 75352 Paris, France

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ISBN 978-92-3-100505-3

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Cover and chapter pages: Artwork by Francisca Campos Escobar

Designed and printed by UNESCO

Printed in France

SHORT SUMMARY

The 2030 Agenda must be embraced by higher education institutions

With 2030 less than a decade away, it is paramount to think critically and act urgently if we are to achieve the Sustainable Development Goals.

Higher education institutions are uniquely positioned to contribute to the social, economic and environmental transformations that are required to tackle the world's most pressing issues.

This report thoroughly discusses the role of higher education institutions in contributing to the 2030 Agenda, through a focus on three interrelated themes:

1. the need to move towards inter- and transdisciplinary modes of producing and circulating knowledge;
2. the imperative of becoming open institutions, fostering epistemic dialogue and integrating diverse ways of knowing; and
3. the demand for a stronger presence in society through proactive engagement and partnering with other societal actors.

The report directs attention to the systemic barriers that have inhibited transformations in these three areas so far, and provides advice and examples on how to achieve this.

The report calls on higher education leaders and actors to push for transformations within their institutions, using the report's recommendations to critically reflect and act on their role for achieving the 2030 Agenda.

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"Since wars begin in the minds of men and women it is in the minds of men and women that the defences of peace must be constructed"

Knowledge-driven actions: Transforming higher education for global sustainability

Independent Expert Group on the Universities and the 2030 Agenda

Foreword

Transformation is the red thread running through all the Sustainable Development Goals, the United Nations' agenda for responding to global challenges facing humanity and the planet. Setting our world on a more sustainable course requires radical shifts in current development paradigms that are exacerbating inequalities and imperilling our common future. This transition is dependent on new knowledge, research and competences that only higher education institutions are in a position to provide, rooted in their historic role of service to society.

While many higher education institutions are already contributing positively towards sustainable development, much deeper and far-reaching transformation is essential. It is not enough to simply recognize in an aspirational way the paramount role that higher education institutions can play in relation to this agenda. Rather, it is essential to look at what really stands in the way for these institutions to contribute significantly to the Sustainable Development Goals, and thus to a fairer, more humane, democratic, inclusive and peaceful future for all. To determine how these barriers might be overcome requires reflection on what kinds of knowledge are necessary, whose knowledge is needed, and how higher education institutions can address these challenges and their impacts, both within academia and beyond in an increasingly diverse yet interdependent society.

The UNESCO Global Independent Expert Group on the Universities and the 2030 Agenda was precisely tasked one year ago with advancing this reflection and making recommendations to inform the 3rd World Conference on Higher Education to be held in Barcelona in May 2022.

The Sustainable Development Goals require a change in outlook and practice that are reflected in this report. The Expert Group advocates for more inter- and transdisciplinary approaches in education and research because only a holistic approach can design adapted solutions. It stresses the need for universities to become more open institutions able to integrate diverse cultures and knowledge systems, and take a more democratic approach to knowledge sharing. It urges for a much stronger presence in society through awareness raising, outreach and partnerships. The objective is for sustainability to become a core practice and purpose of higher education institutions, reflected in structures, programmes and activities, putting students in contact with real-world problems and immersive experiences.

As we are now less than a decade away from 2030, it is more urgent than ever to think critically about how higher education institutions can take on this role in supporting the necessary transformations towards the 2030 Agenda. To do so in a meaningful way, higher education institutions must look both internally at their modus operandi as well as externally in how they relate and contribute to society, taking a human rights approach to all education and research. They must become more inclusive of all sectors of society in the student body and faculty.

I wish to applaud the comprehensive work undertaken over the past year by the members of this Expert Group, and invite all higher education stakeholders to engage with the discussions in this publication. Our hope is that this report will act as a reflective piece and encourage higher education leaders and stakeholders to think critically and act urgently in support of the 2030 Agenda for Sustainable Development, because it is our very survival and common future that is at stake.

Stefania Giannini
Assistant Director-General for Education
UNESCO

About this Initiative

A call to the global community of higher education institutions

In 1964, inspiring the 1968-student revolt a couple of years later, Herbert Marcuse wrote a key text against "one dimensional man", urging universities and campuses around the world to become places that resisted reductionism. He urged for a thinking that would show us alternatives beyond the universalizing forces of current rationalism. Universities, especially through higher education, could pave the way for human development independently of industrialized society. Giving attention to that which is not captured in the universals of one-dimensional-man, formed to serve the productive, consuming society, he created visions for alternatives. Above all, his call was to the universities and to the students in particular, as they occupy those key position outside of productive society; still on the outside but geared towards the processes of its reproduction.

In many ways, we now need to re-read this, because the change that was called for, has failed to materialize. In 2021 we have experienced dramatically increased inequalities, especially due to the COVID-19 pandemic, loss of biodiversity, accelerating climate change and increased burning of non-renewable energy sources. The 2030 Agenda is a global framework aimed at radically turning this development around, leaving no-one behind, and securing a planet and a world that is inclusive and habitable also for future generations.

The University of Bergen, in collaboration with a joint university-initiative in Norway, "SDG Norway-higher education and research", approached UNESCO for a dialogue on how we, at the universities around the world, could engage in these pressing issues of our time. The UNESCO Assistant Director-General for Education, Prof. Stefania Giannini, was invited to give a keynote at the annual and national SDG conference in Bergen in 2018. Here we started the discussion on how the 2030 Agenda challenges us as researchers, teachers and leaders of higher education and research institutions to think differently. Through the joint "SDG-Norway-higher education and research" platform, universities in Norway called for a global conversation on these issues, and UNESCO responded.

Subsequently, the process of this Expert Group was ignited. The 14 experts who formed the group and authored the current report were nominated and selected on the basis of scholarly background and achievement, and representing a variety of different trajectories, scientific disciplines and institutions, ensuring geographical and gender balance. They were tasked with proposing guidelines and actions for how universities can facilitate the necessary knowledge development and new research and education strategies that can generate the deep-going transformations needed in our society, economy and environment. The result is the current report.

Our aim, and our sincere hope, is that this report, and its advice to governments and higher education leadership, can become an object of discussion and conversation in the global higher education community. Even more importantly, that it might create a dialogue between higher education institutions and other sectors: business and industry, policy-makers, and civil society, among others. We need to ask: how do we, in campuses around the world, start the important process of thinking of alterative futures?

Annelin Eriksen
Vice-Rector for Global Relations
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Acknowledgements

This report is the outcome of a collaborative work of a number of people. First and foremost, we would like to thank all members of the UNESCO Global Independent Expert Group who have collectively authored this report: Adrian Parr, Agnes Binagwaho, Andy Stirling, Anna Davies, Cheikh Mbow, Dag Olav Hessen, Helena Bonciani Nader, Jamil Salmi, Melody Brown Burkins, Seeram Ramakrishna, Sol Serrano, Sylvia Schmelkes, Tong Shijun and Tristan McCowan. All the authors forming this group generously shared their knowledge and time over the course of one year, with several group and subgroup meetings in order to put this report together. While this process was originally envisioned to be carried out in-person, through the commitment and dedication of all members of the group, it was made possible to produce such a fruitful report in a fully-online process. We would especially like to thank Anna Davies, Tristan McCowan, and Dag Olav Hessen for coordinating the three main themes developed in the report.

We would like to thank the institutions who facilitated the process of this report: both UNESCO and the University of Bergen as the chair of the National Committee for the 2030 Agenda in Norway's university sector (SDG Norway). SDG Norway consists of the University of Oslo, the University of Bergen, the Norwegian University of Science and Technology (NTNU), the Norwegian University of Life Sciences (NMBU), the Arctic University of Norway (UiT), Universities Norway (UHR) and the National Union of Students in Norway (NSO). It was primarily Rector Margareth Hagen, Vice-Rector Annelin Eriksen, and Assistant Director Tore Tungodden of the University of Bergen who first put forward the initiative of this group. The University of Bergen obtained financial support, hosted the group's meetings and provided technical and general support throughout the entire process.

Special thanks should be given to the UNESCO Education Sector, notably the Higher Education Section led by Peter Wells, for their necessary motivational input during our plenary meetings and their continued support throughout the report's development.

The report would not have been possible without the substantive and efficient support of the Secretariat: Phoebe Kirkup and Paz Portales from the UNESCO Higher Education Section, and Thomas Völker and Kristin Svartveit from the University of Bergen. Professors Roger Strand and Rasmus Slaattelid, also from the University of Bergen, provided valuable insights in the process of writing this report. Furthermore, Alayna Kasuri (Dartmouth College, USA) and Brianna Ngarambe (University of Global Health Equity, Rwanda) should be recognized for their research support throughout this process.

The International Science Council and the International Association of Universities supported through nominating members to the Expert Group and served as supporting partners throughout the process, for which they are sincerely acknowledged.

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Executive summary

Universities and, more broadly, higher education institutions (HEIs), need to use the knowledge they produce and their education of new professionals, to help solve some of the world´s greatest problems, as addressed by the Sustainable Development Goals (SDGs) set out by the United Nations (UN). Humanity is facing unprecedented challenges, most strikingly so in relation to climate change and loss of nature and biodiversity, as well as inequality, health, the economy, and a suite of issues related to the 2030 Agenda. Given this new reality in which the future of humans, along with other species, is at stake, it is time for HEIs and their stakeholders to systematically rethink their role in society and their key missions, and reflect on how they can serve as catalysts for a rapid, urgently needed and fair transition towards sustainability. The complexity of the issues at stake means that solutions should be part of a radical agenda that calls for new alliances and new incentives.

It is also time for HEIs to make sustainability and SDG literacy core requisites for all faculty members and students. Sustainability education should bring students into contact with real-world problems and immersive experiences. Appreciating the greater good of both people and planet, and contributing to values beyond mere monetary gain will further enthuse and inspire students and faculty mentors alike. Ultimately, the educational culture at universities and HEIs needs to encourage students to learn via experimentation and critical thinking from multiple perspectives.

This report is undoubtedly about the SDGs; however, it is important to realize that these will expire in 2030. We thus strongly recommend that HEIs, while being a part of that agenda, should also look ahead – not only to implementing the SDGs, but also to being intensively involved in crafting the next steps and goals beyond 2030. A long-term perspective needs to be adopted for both HEI activities and policies.

The **call** this report makes is for universities and HEIs to play an active part in an agenda that has the consensus of 193 countries and aims to resolve some of the world's most pressing problems, as stated in the 17 SDGs.

The **challenge** is for HEIs to embrace the 2030 Agenda, because if they do not it will be difficult, if not impossible, to achieve the SDGs. The SDGs represent a unifying challenge for all universities and HEIs, and this must be reflected in plans and actions for research, education and outreach.

HEIs have played a crucial role as bringers of societal enlightenment and change over the centuries, maintaining their role as free and critical institutions while also – to varying degrees – aiming to perform a service within societies. It is essential to maintain and encourage these important roles and enable HEIs to combine their traditions of critical thinking with problem-solving activities, while also adjusting their role in the light of societal changes. The future of humanity and our planet is under threat, and the need for critical thinking and societal change is therefore more pressing than ever.

HEIs should inspire societal change when necessary, taking a leading role in the transitions necessary for humankind and emphasizing that the need for change is immediate. This also implies that HEIs should think critically about their own practices, curricula and research, and about how to motivate their employees, students and society at large to do the same.

The **opportunity** for answering the call is now. HEIs, their leaders, faculty and students have specific roles and responsibilities in societal transformation, according to the type of institution and the problems faced. For this purpose, the **structure and culture** of HEIs have to **change**, and **barriers** to the necessary transformations within HEIs must be identified and gradually eliminated.

This report focuses on, and advocates, three main areas of HEI transformation: **the need to move towards inter- and transdisciplinarity** in education and research; the imperative need for institutions to become open, **fostering epistemic dialogue and integrating other ways of knowing**; and the demand **for a much stronger presence in society** in general through proactive outreach activities and partnering with other societal actors, in order to build awareness of ecological deterioration and the SDGs in general, and to influence policy. This implies directly intervening in experimental projects that test solutions, with the participation of students. The report deals with some of the systemic barriers that might hinder progress in these three areas of transformation.

The recognition of the value of life and the need of all humans for quality of life requires a **reaffirmation of the human rights-based approach to the education we give and the research we carry out.** This implies recognizing that achieving human rights for all is not possible unless we actively protect our natural resources and all forms of life, and struggle constantly against the power relations that foster inequality and all forms of violence and discrimination. **It also implies an appreciation of the value of cultural diversity**, recognizing the contribution different cultures can make to progress towards these goals. **Equity and inclusion** are values that also stand out when embracing the 2030 Agenda; **the commitment to leaving no one behind** becomes key. The contribution of HEIs is manifold: theoretical, philosophical and, clearly, ethical. It must also be geared to removing barriers towards sustainable societies and the greater well-being of people and planet.

The recommendations in the report address the ways in which HEIs – recognizing the very different cultures and contexts within which they have emerged and operate – can move forward towards each of these objectives, and how the existing structural and cultural barriers discussed in the body of the report might be transformed.

General recommendations

HEIs have ethical principles and values. It is time to make them explicit and foster awareness and discussion around them. Critical thinking is one of these values and needs to remain a core issue for HEIs, not least in relation to complex matters of sustainability and achieving the SDGs. Beyond this, sustainability should become a core practice and purpose of HEIs and be reflected in structures, programmes and activities. HEIs are called on to face the complex problems of the world today, which is why they should incorporate inter- and transdisciplinary activities in education and research and strengthen the relationship between research and education. It is also time to ensure that various ways of knowing, learning and sharing knowledge are visible and that HEIs have committed to them, and for HEIs to foster dialogue and engagement with diverse communities – particularly those traditionally marginalized in these settings – acknowledging the value of difference. Among the responsibilities of HEIs is sharing and democratizing knowledge and building awareness of the consequences of unsustainable ways of production and consumption and the problems of inequity and exclusion, and of the need to progress towards the 2030 Agenda. It is strongly recommended that HEIs strive for a more equitable representation of all sectors of society in both the student body and the faculty, and strengthen lifelong learning activities.

Recommendations for education

Students will become the workforce of the future and as such they require a strong ethical grounding so that they commit to and strive for sustainability and inclusion in their activities. To provide a holistic outlook on the problems and their possible solutions, more inter- and transdisciplinary programmes and study

programmes on sustainability issues should be developed. For this purpose, study programmes must include inter- or transdisciplinary courses related to the SDGs, and education in general should employ inclusive approaches and respect for diverse cultures and knowledge systems. Students need more opportunities for engaging in experiential and dialogic activities with different communities in society. Student and faculty participation in building education around sustainability should be strongly encouraged, in a continuous effort to internally democratize HEIs around priority issues.

Recommendations for research

HEIs should not cease to protect and expand academic freedom for the promotion of systemic change. Basic and curiosity-driven research should also be maintained as a core principle where relevant. However, HEIs should also strive to move beyond the traditional separation of basic and applied research. Internal incentives should be adapted to foster research projects, programmes and centres that deal with the degradation of nature, climate change and inequalities, as well as those that require the participation of multiple disciplines; these should in all cases include the social sciences and the humanities. Alternative research methodologies, such as participatory action research, should be experienced and refined to progress towards the coproduction of knowledge with diverse communities and transdisciplinary research. More emphasis should be put on SDG-related achievements and broad research for careers, curricula and promotion of researchers. Ranking systems that discourage collaborative and committed research should be radically revised. Consistently with the role of HEIs as democratizers of knowledge, open access publications and open science policies should be gradually embraced, and the dissemination and application of research results should be expanded.

Recommendations for outreach and community engagement

Outreach and community engagement policies must be much more proactive to fulfil the role of HEIs in sustainability. Policy advice, engagement in societal projects for sustainability, and the involvement of different sectors of society to partner in taking action towards the SDGs have to be strengthened. Awareness raising that explains sustainability problems and favours policies, societal actions and personal behaviours that combat climate change, nature loss and inequality among the different sectors of society clearly needs to be expanded. Free open knowledge platforms should form part of these activities. Creating and participating in networks between academics, civil society and economic sectors with a focus on collaboration towards the SDGs should also be stepped up. Existing multilateral networks between HEIs for the purposes of fostering collaborative research and education projects should be strengthened, and new ones developed. Partnerships between HEIs in high, middle and low-income countries should be revised to make room for more equal and productive relationships and emphasize capacity-building for sustainability.

Specific recommendations

The following specific recommendations that emerged from the group's discussions emphasize the support necessary from external institutions:

- **Quality assurance mechanisms fostered by governments.** Such mechanisms should give due value to what is done in HEIs to promote and advance the SDGs.
- **A Global SDG Research and Teaching Central Fund** to support faculty and teaching grants and fellowships for programmes and projects related to the SDGs.
- **A Global SDG Higher Education Institution Benchmarking system** could be set up which, unlike a ranking system that creates a competitive environment working from the top down, would qualitatively and quantitatively compare how HEIs advance different SDGs across the three areas of education, research, and outreach, with highest recognition given to those that holistically address a large number of SDGs across all their activities.

- Under the UNESCO umbrella, an **annual SDG Research and Teaching Conference** could be held to foster exchange of ideas and best practices to address the current global challenges, deepening exchange between countries and regions.
- **Donor agencies should consider greater investments in institutions in the global South** to boost the capacity of local researchers, research institutes and think tanks to avoid a South-to-North brain drain and allow all countries to find sustainable solutions that match their needs.

The following three specific recommendations for HEIs merit inclusion in this summary:

- To anchor and monitor sustainability activities in HEI governance structures, HEIs should consider establishing the post of **Chief Sustainability or SDG Officer and/or a sustainability committee at the top level.**
- HEIs must **refuse to engage in research that supports non-sustainable practices** (for example, the fossil fuel industry) or invest their endowment funds in support of the fossil fuel industry.
- HEIs should establish **SDG-aligned and 'sustainable campus' policies that develop prototypes of sustainable institutions.** Once these are well developed, HEIs could certify institutions in sustainability at different levels, with clear goals for reaching higher levels of certification.

In accordance with its mandate, the report set out to address the interplay between research, higher education and sustainable development from a global perspective. We have strived to achieve this, first, by developing the idea of working together for the SDGs, and making the argument for a move towards inter- and transdisciplinary education and research. Second, we have tried to communicate the importance of embracing the pluriverse and opening up HEIs to a profound epistemological dialogue with other ways of knowing and with different sectors of society, including those that have been marginalized in higher education. Third, we have stressed the importance of strengthening the role of HEIs in society and seeking a strong voice in policy and practice through potent partnerships and networks. These three areas of further development of HEIs have strong cultural, structural, and even organizational and financial implications. The final recommendations, therefore, are intended to be studied and debated not only by the global higher education community, but also by governments, funding agencies and civil society organizations that can engage with HEIs in better fulfilling their role in working towards a more sustainable and just society.

We finish this report at a time when many countries are experiencing a new wave of COVID-19, which has now affected multiple aspects of humanity for more than a year and a half. COVID-19, which involves endangerment of life, in this case human lives, is one severe consequence of unsustainable ways of relating to nature. The impact of this pandemic on poverty, inequality and also on the environment underlines the call this group is making for HEIs to work harder in support of the 2030 Agenda towards a healthier, more sustainable and more inclusive world.

CHAPTER 1
Introduction

1.1 The Call – Creating and applying knowledge for global sustainability

Humanity is facing unprecedented challenges, most strikingly so in relation to climate change and loss of nature and biodiversity, as well as inequality, health, the economy, and a whole suite of issues related to the 2030 Agenda. These are not novel insights, in fact they were expressed clearly as early as 1987 by the Brundtland Commission Report (WCED, 1987), but despite warnings and increasing awareness, the 'business as usual' trajectories have continued to dominate. Over the past few decades there has been a growing consensus that we are heading towards an unsustainable and dangerous future. The ultimate risk is that we will reach regional and global tipping points in climate, biodiversity and ecosystem services (Lenton et al., 2019; Lenton, 2020) with the risk of 'untold sufferings' (Ripple et al., 2019) for humankind. The increased risk of extreme climate events may also have cascading or domino effects on all the Sustainable Development Goals (SDGs) (Reichstein et al., 2021). The recent IPCC report (2021) clearly expressed the seriousness of the situation and the urgent need for action. Given this new reality in which the future of humans, along with other species, is at stake, it is time for universities and, more broadly, higher education institutions (HEIs)[1] to systematically rethink their role in society, their key missions, and how they could serve as catalysts for the necessarily fast transition towards sustainability that is required. The complexity of the challenges faced means that solutions should be part of a radical agenda that calls for new alliances and new incentives.

Most of the SDGs are directly or indirectly associated with the overarching and fundamental challenges caused by climate change, loss of nature and natural resources, health and poverty/inequality. Although these key issues have been identified, the 2019 Global Sustainable Development Report emphasizes that '...recent trends along several dimensions with cross-cutting impacts across the entire 2030 Agenda are not even moving in the right direction' (Independent Group of Scientists appointed by the Secretary-General, 2019, p. xx). Climate change not only implies increased risk to nature and society in terms of gradual changes and extremes in terms of heatwaves, cold periods, drought, forest fires, flooding as well as avalanches and rising sea levels. It also poses a major threat to human health both directly and indirectly via pests and diseases, political instability and migrations, and to food production, water security and a raft of life-sustaining ecosystem services (see IPCC, 2014 and 2021). Loss of nature and diversity in terrestrial systems also affects a range of critical ecosystem services and represents a loss in its own right from an ethical and biocentric perspective. These issues are highly intertwined; a loss of nature and a warmer and more acidic ocean has major implications for carbon sequestration and climate. Similarly, loss of biodiversity has consequences for food supplies and well-being.

Inequality, and its consequences for poverty and hunger, are deep ethical problems per se, with strong implications for health issues that will worsen with a changed climate and degraded nature. Poverty also promotes loss of nature and diversity since scarce resources are overused. Moreover, inequality, poverty and social injustice put basic human rights at risk and pose a threat to education, social welfare, trust and stability. On top of these current and pressing practical and ethical challenges comes the moral imperative to care for the well-being of future generations of humans and also the multitude of other life forms on the planet (de La Bellacasa, 2017; Felt et al., 2013).

This report is about the SDGs; however, it is important to realize that these will expire in 2030. We thus strongly recommend that HEIs, while being a part of that agenda, should also look

1 The Global Convention on the Recognition of Qualifications Concerning Higher Education, adopted by the UNESCO General Conference at its 40th session on 25 November 2019, defines a higher education institution as 'an establishment providing higher education and recognized by a competent authority of a State Party, or of a constituent unit thereof, as belonging to its higher-education system' (UNESCO, 2019, p. 2). For the purposes of this report, we conceptualize higher education institutions in line with this definition.
In terms of the International Standard Classification of Education (ISCED) this corresponds to ISCED levels six and above. For more information on the ISCED, see http://uis.unesco.org/en/topic/international-standard-classification-education-isced (Accessed 23 August 2021).

ahead – not only to implementing the SDGs, but also to being actively involved in crafting what the next goals should be (McCowan, 2019). Time is a critical aspect here in two respects: first, the time window to avoid critical climate change and damage to societies and ecosystems is indeed narrow. Secondly, the future time horizon should be widened, and go way beyond 2030. Humankind has existed for some hundreds of thousands of years, and our goal should be both human well-being and a healthy planet for non-human life in the long term – we must stop discounting the value of the future.

It is important for universities and HEIs more broadly to retain their position as arenas for developing and debating critical ideas, basic research and education and freedom of thought. However it is crucial that they strengthen their role now, as providers of knowledge and solutions in order to play a key role in this agenda, through exploring and explaining the risks to societies and the natural environment, advising on remedies and engaging in societal transitions (in technology, social norms, consumption, law, the economy and distribution of goods) that counteract the risk of dangerous shifts in climate and ecosystems (Cai et al., 2015). This calls for a radical new mode of inter- and transdisciplinary action in research and education, a matrix in which new horizontal structures and platforms add to the vertical, often silo-like structures of faculties and their departments. It also calls for much more active outreach and community engagement, providing science advice for policy and extended networking and alliances, while at the same time approaching society with an open attitude and a willingness for dialogue.

This report takes as its point of departure these new challenges to humankind and all forms of life on the planet, and the new role that HEIs need to assume for economic, societal and environmental transformation. It also adopts a human rights-based approach as its frame of reference. This means that it firmly takes the position that all human beings, merely by virtue of existing, deserve equal respect for their basic human rights as spelled out in the Universal Declaration of Human Rights (1948), as well as in the second and third generation of human rights instruments on social, political, economic and cultural rights. It argues for the acknowledgement and appreciation of cultural diversity and considers that the consensus of 193 of the world's countries (United Nations, 2015) around the 2030 Agenda of the United Nations supports a more equal distribution of general well-being in the world, as well as the achievement of what is needed to ensure a sustainable future for life on the planet. It believes that the SDGs define some of the most important purposes to be achieved in order to fulfil this consensus. The institutions and organizations of nations and societies are called upon to work towards these goals. HEIs in general are key to our progress towards them.

1.2 The Challenge: Informing the 2030 Agenda

The main argument of this document is about the importance of universities and HEIs in global progress towards the SDGs.[2] If they do not embrace the 2030 Agenda, it will be difficult, even impossible, to achieve. Their role is key for several reasons that are elaborated in this report.

HEIs have accumulated knowledge and research procedures that can both explain and contribute to solving the main ecological, economic and social problems that face societies both locally and globally. The academic freedom they profess and defend, as well as their normative structure and

2 Throughout this report we recognize and refer to the wide diversity of universities and HEIs, and the fact that these concepts also are used differently over time and in different parts of the world. Hence for simplicity we use the term HEIs throughout this report, except where there are historical or other reasons for mentioning universities specifically. We are aware that these seemingly homogeneous terms mask a broad range of different institutional forms of research and education embedded within particular cultural, socio-political and economic contexts. Research and HEIs operate in different contexts, and are diverse in their size and structure, focus and resourcing. While aiming at providing insights and recommendations that are useful for a majority of these institutions, we are aware that this report will not be able to take account of all of the institutional diversity and richness that lies behind those terms.

ethical principles, have allowed most HEIs to be oriented towards an understanding of our world's problems and in many cases towards possible solutions to some of them. HEIs have drawn on this knowledge, produced globally, to design their educational programmes and are training new generations of professionals with knowledge, skills and ethical principles that it is hoped will guide their professional decisions and actions. As aspirational, free institutions, HEIs in general are particularly open to novel and critical thinking and therefore also represent unique intellectual spaces for rethinking sustainable development.

The SDGs prioritize the problems the world faces at the global level in order to ensure a dignified future for life on the planet. They also represent a global agreement by 193 countries on the roadmap for working towards desired outcomes through targeted goals (United Nations, 2015). Embracing the 2030 Agenda does not in general challenge universities' and HEIs' academic freedom. On the contrary, precisely because of their academic freedom, most universities and many other HEIs are in a privileged position to propose and provide bold and novel contributions to the SDGs. Their decisions on academic programmes and research activities must remain their own. However, in the light of what has been said, and in line with the ethical principles of universities and HEIs, the 2030 Agenda and the SDGs should become important priorities and be given more weight within these institutions (cf. Schneider et al., 2019). Universities, and more broadly HEIs, should prioritize those SDGs to which they are best able to contribute.

Universities have played an increasingly important role throughout their long history (for example, the Universities of Bologna, Paris, Oxford and Cambridge dating back to 1088, 1150, 1167 and 1209 respectively), starting out as elite institutions before transforming into mass institutions in recent decades. Their role in the enlightenment, humanism and prosperity of societies is of immense importance, and as such they have changed societies for the better (Pinker, 2011). The flipside of this is that HEIs' activities have also contributed to some of the problems that now require the SDG 2030 action. Against that background, the premise of this report is that HEIs in general are uniquely well positioned to take action towards achieving the SDGs.

Universities have developed and evolved into a broad spectrum of HEIs over the past decades, and in very recent years some of them have become more instrumentalized (cf. Collini, 2017): financing from governments sometimes guides HEIs' projects and developments, and the business sector has an interest in placing resources primarily in activities with economic potential. This context requires the whole HEI sector to reflect critically upon its wider role in societies, especially in the light of the multiple SDG challenges.

1.2.1 Higher education institutions and the SDGs

The SDGs are without a doubt ambitious, one might even say Utopian, but they are both diverse and plural. The diversity of goals, metrics and targets catalyses and articulates different kinds of knowledge. However, there are also strong forces and structural configurations that oppose sustainability, short-term outlooks on the part of governments, enterprises and even individuals who see their interests challenged by moving towards these goals. This calls for a strong stand on the part of HEIs regarding the need for sustainable development.

There are substantiated criticisms that the 2030 Agenda, with the 17 SDGs, represents an imposition that is based on a fragmented view of the world.[3] However, the deterioration of the quality of life of the majority of the world's population due to inequality and poverty, as well as the depredation of the environment and the resulting climate change have led to the identification of points of no return if humankind does not change its patterns of production and consumption (Nature, 2021).

The 2030 Agenda calls for 'leaving no one behind'[4] and the role of HEIs is key in proposing and testing

3 For critically appreciative perspectives on the SDGs see for example Eisenmenger et al., 2020; Fukuda-Parr and Muchhala, 2020; or Leal Filho et al., 2018.

4 https://unsdg.un.org/2030-agenda/universal-values/leave-no-one-behind (Accessed July 26, 2021.)

social policies and strategies for inclusion in all areas, such as health, employment and poverty reduction, and particularly in the area of education to which these institutions belong (Bengtsson et al., 2018). SDG 4 seeks to ensure that by 2030, there is inclusive and equitable quality education and that lifelong learning opportunities are promoted for all. Elitism in HEIs can partly be attributed to the unequal distribution of quality elementary and secondary education. This is something that must be combated with determination from many angles, but HEIs should play a key role in educational inclusion at all levels.

The 2030 Agenda is a call to all sectors of society worldwide. HEIs have a particularly important role to play in progress towards the SDGs. As plural institutions, they have built a reservoir of knowledge on each of the SDGs that both theoretically and technically underpin proposals for the advancement of each of the goals. They also have the ability to convene different sectors of society to debate and define the ways ahead with a long-term perspective. They are not generally dependent on short-term returns, thus allowing for new ways of handling the problem of discounting, i.e. devaluing the future versus the present. They are prestigious institutions that have the trust of their constituency, and can foster that by proposing ever more robust solutions to social demands. Finally, they have the power to train new professionals with a different outlook on the future of the planet and their role in achieving it (Walker and McLean, 2013; Ravetz, 2019).

It is not possible for HEIs to opt out of this key role. It is within their power and their responsibility to strengthen their contribution to building more equitable, just and sustainable societies. The 2030 Agenda can become the beacon for unifying strategic planning towards this goal.

1.3 The Opportunity: Higher education leadership for the 2030 Agenda and beyond

If HEIs are to make their potential contribution to the 2030 Agenda and the SDGs explicit priorities in their future work, we see advantages in reflecting, as HEI communities, on the need for HEIs to change certain key elements in their principles, procedures and organization in order to facilitate their contribution to a sustainable and equitable world. These changes are outlined below.

1.3.1 Answering the Call: Our responsibility as higher education institutions

HEIs have ethical principles. The call is not so much to change them as to make them explicit, ensure the community is aware of them, that teaching and research activities spell out the way these values are put into practice, and that universities and HEIs have mechanisms to ensure and evaluate all university and HEI activities for consistency and congruence with them.

Emphasis should be placed on the ethical values inherent in sustainability. These involve stressing the value of all forms of life. They also involve visualizing the future and the people and species that will inhabit our planet for many generations to come. Of necessity, values must embrace more reasonable and sustainable ways of life, and the need for transforming the way we produce, consume and utilize our waste.

Valuing life involves valuing the quality of life, and this means standing up for minimum welfare standards for all, and therefore for equitable distribution of opportunities, goods and services.

Valuing sustainable ways of living will also require networking and alliances with others in society striving for the same objectives. These others include all those who combat depredation and build solutions to problems that may be

local but affect us all. Traditional societies and ethnic minorities and other groups subject to discrimination on prohibited grounds (such as gender, disabilities, etc.), should be included among these allies.

A strong stand on values related to sustainability demands that the voice of universities and HEIs be heard in society, that clear recommendations derived from research be made known to policy-makers, and that advocacy activities be included as a part of universities' and HEIs' outreach. In some cases, the strong stand on sustainability values may involve universities and HEIs in interventions at the local level in order, among other things, to demonstrate the efficacy of new approaches and solutions, as well as to impact local realities.

1.3.2 Educating the centennial generation

Education is a key role in most HEIs. In contributing to the 2030 Agenda and beyond, HEIs have to consider the fact that problems related to sustainability and social justice are complex and require an interdisciplinary or transdisciplinary approach, since no discipline on its own is able to comprehend this complexity, still less contribute to solving these complex problems. This means that educational programmes should be designed with an approach that transcends the disciplines and trains students to work together with persons with different expertise.

In line with what has been said about making ethical principles explicit in every HEI activity, educational programmes should include ethics training for future professionals in all the HEIs' stated values, including those related to fostering sustainable lifestyles and training advocates for sustainability and equity. This process should be explicit, and should be discussed, critiqued and preferably endorsed by the students. The aims of training students as citizens with global and local responsibility should be shared by faculty and students alike.

Subject areas related to the 2030 Agenda, such as intercultural understanding, gender equality, human rights, social justice and, of course, sustainability, should be transversal across the different educational programmes and made explicit in their educational objectives. Academics and HEI teachers should be made aware of the importance of these subject areas and, where necessary, trained to incorporate them in the syllabus of their courses.

Awareness of ecological and social problems, as well as the development of social and civic responsibility and the adoption of values and principles, are best achieved when students directly engage with such issues in their studies and focus on contemporary societal challenges and social transformation through inter- and transdisciplinary projects carried out at the local level.

In many parts of the world, HEIs are selective and exclusive, as they leave out entire sectors of the local and national population due to both academic and economic conditions, often impacting disadvantaged groups (for example by ability, ethnicity or gender). However, diversity of outlook, with students that reflect the diversity of the country or region in which the institution is situated, strengthens and enriches dialogue, debate and the search for solutions to common problems. It is a challenge to be able to represent the different sectors of society within each of our institutions. However, doing so has critical implications for the ability to generate solutions to societal problems within higher education settings.

The importance of strengthening the relationship between research and education is therefore an issue that becomes particularly important in working towards the 2030 Agenda.

The centennial generation, now enrolled in HEIs, seem to be increasingly aware of sustainability issues and concerned about the future due to the very direct impact of these on their life prospects. Universities and, more broadly, HEIs should take their concerns and motivation seriously. This is one reason, though not the only one, to open up multiple opportunities for student participation in decision-making and in all types of initiatives, and foster the ability of students to make their own decisions and design their own extracurricular activities, within the clear framework of the values set out by their HEIs.

1.3.3 Centring knowledge on sustainability, inclusion, and equity

HEIs should update and deepen their reflection on the ethical question of how the application of knowledge, while bringing immense benefits to some, has sometimes harmed human and non-human life (see Jasanoff, 2016). For example, fossil fuel-driven energy production, the fusion of the atom, the development of pesticides and a number of agricultural practices, the production of toxic waste and the destruction of cultural diversity through education have produced negative outcomes. There are many others that are not as visible but subtly present in our training and research programmes.

There is a clear need to question the efficacy of the knowledge produced and its application to the solution of problems affecting our societies and our planet today, such as the ones covered in the 17 SDGs. We cannot stress enough the importance of progressing as humankind towards each of these goals. However, in many cases it is not HEIs that are addressing these problems. It is mainly commercial pharmaceutical companies that have developed vaccines against COVID-19, to give one example. Knowledge-building in many areas, especially those that have commercial possibilities, is being transferred from HEIs to profit-oriented global enterprises that are not guided by ethical frameworks but motivated by profit.

At the same time, there are extremely few knowledge-management policies able to restrain unethical and dangerous uses and applications of the knowledge produced. It is not superfluous to mention the fact that some HEIs, as well as some individual researchers working in them, have been instrumental in some of these activities because funding for research is often available from these sources. There are many interests behind knowledge-building processes, so much so that knowledge is often seen and treated as a commodity. Instead of democratizing knowledge, which should be a common good, it is being privatized. This phenomenon calls for a rethinking of the protection of rights, the regulation of the applications of knowledge, and the need to foster progress towards an open science policy (UNESCO, 2021).

One area in which HEIs in general are particularly called on to demonstrate the social robustness and impact of their activities is education. HEIs are part of national educational systems, and they belong to the world or the sphere of education. They have to deal with the consequences of good or poor-quality education at lower levels. They also face the effects of selectivity of candidates due to drop-out rates at lower levels of education. They should take a special interest in influencing policy and practice regarding inclusion, quality and equity in the entire educational system, starting from early childhood education. Many HEIs are involved in initial teacher education, and this is a particularly privileged space for influencing practice towards inclusion and quality at the lower levels of education.

SDG 4 on quality education includes the opening of opportunities for lifelong learning for all, which requires the strengthening of equity and inclusion at the higher education level, as highlighted in the SDG-Education 2030 Steering Committee's report on *Making Higher Education more Inclusive* (2020). This role of HEIs in general is traditionally carried out through adult education, but a review of these activities is needed, to also include education for sustainable development. An analysis of the diversity of those benefiting from lifelong learning activities is necessary. In short, the potential contributions of HEIs to SDG 4 should be high on the list of priorities.[5]

1.3.4 Democratic management and student participation

The changes to be brought about in HEIs in order to contribute to the 2030 Agenda and have an impact on the future of the planet and humanity have to be shared by their communities, in line with SDG 16, which refers to building 'effective, accountable and inclusive institutions' and particularly to target 16.7 that calls for ensuring 'responsive, inclusive, participatory and representative decision-making at all levels'.[6] This

5 https://sdgs.un.org/goals/goal4 (Accessed 30 August 2021.)

6 https://sdgs.un.org/goals/goal16 (Accessed 30 August 2021.)

calls on HEIs to strengthen their management systems in order to socialize their purposes and listen to proposals for change from the different sectors of society. Faculty is of course key in this process, but so are educational administrators and personnel in general. Students, too, play a key role, as youth are very much aware of sustainability issues that affect their future. They are primed for consciousness and willing to take committed action if they feel it will alleviate their already central concerns. Networks, alliances, advocacy, research and intervention projects are natural ways in which students express their desire for a different world, and an excellent, productive and formative way of channelling their nonconformity.

1.3.5 Context of COVID-19

HEIs all over the world have risen to the COVID-19 challenge by generously contributing their scientific knowledge and resources to help in the fight against the pandemic. Within a few weeks after the onslaught of the deadly virus, universities developed a faster and cheaper COVID-19 test in places as diverse as Colombia, the United Kingdom and Viet Nam. Laboratories within universities have produced medical supplies, sanitizing equipment, medicines and ventilators. In sub-Saharan Africa, several universities have been at the forefront of epidemiological research and communication to the public on the COVID-19 crisis, notably in Ghana and Nigeria. Before the February 2021 coup, two universities in Myanmar, Yangon Technological University and Mandalay Technological University, designed robots that can transport food, medicine and trash at hospitals and thereby reduce the need for person-to-person contact (The Irrawaddy, 2020). The response of HEIs to the current crisis illustrates the importance of their role in generating knowledge and sustainable technological applications that contribute to solving both global and local problems and leading humanity in progressing towards the SDGs.

The strong contribution that research universities can make is conditional upon governments recognizing and respecting their key scientific role. In a recent letter to African Ministers of Higher Education, the General Secretary of the Association of African Universities urged African governments to use the pandemic as an opportunity 'to strengthen our educational institutions and systems by making them future-ready and able to survive and thrive in a world of uncertainty' (Association of African Universities, 2020, p. 1). By contrast, in Brazil, several universities stepped in to provide health advice to the population, in the absence of evidence-based policy guidance at the highest levels of the federal government. In the United States of America (USA), it is tragically ironic to observe a disconnect between scientific evidence and policy action regarding COVID-19 in the nation with the greatest number of Nobel Prize winners for Medicine in the past century.

1.4. On the nature of this report

This report is the outcome of a one-year collaboration process of a Global Independent Expert Group set up by UNESCO in partnership with the University of Bergen (UiB),[7] and supported by the International Science Council (ISC)[8] and the International Association of Universities (IAU)[9]. The mandate of this group of internationally renowned experts was to reflect on and communicate the transformations needed in HEIs in order to be able to effectively commit and contribute to the 2030 Agenda and the SDGs. It is meant to inform and inspire discussions and agreements in the context

7 https://www.uib.no/en/sdgbergen (Accessed 30 July 2021.)

8 https://council.science/ (Accessed 30 July 2021.)

9 https://www.iau-aiu.net/ (Accessed 30 July 2021.)

of the 3rd World Higher Education Conference[10] – to be held in Barcelona in 2022 – and to continue these global conversations even beyond that. It is worth mentioning that due to the pandemic, all the group meetings have been digital, and that this has clearly posed some challenges. Nevertheless, the fact that the entire report has been written without physical meetings and flights is in itself an interesting example of the potential for this kind of sustainable international, digital cooperation.

The Global Independent Expert Group that authors this report is composed of 14 members from around the globe who have been dedicated to studying and transforming research and education in general, and higher education in particular, throughout their careers. They represent the five regions of the world. It was co-chaired by Dag Olav Hessen, from the University of Oslo in Norway, and Sylvia Schmelkes, from the Universidad Iberoamericana in Mexico.

The contribution of HEIs is manifold: theoretical and philosophical, clearly ethical, and also oriented to removing barriers to greater well-being for all. This report deals with the change needed to protect humanity and the planet, and represents a call for HEIs to contribute their potential to make this possible. It takes the challenges of reality and the new role that HEIs need to take for societal transformation as its point of departure. As we have mentioned, its frame of reference is a human rights-based approach and the aspiration of 'leaving no one behind', which is the overall purpose of the 2030 Agenda. It believes that the SDGs define some of the most important purposes to be achieved in order to reach this consensus. The institutions and organizations of nations and societies are called upon to work towards these goals. HEIs are key to fostering progress towards them.

1.4.1 The structure of the report

The report is structured around three main themes: (1) working together for the SDGs; (2) engaging diverse ways of knowing; and (3) higher education partnerships for sustainability. These themes correspond to three core concerns and questions that this report sets out to address, and while they will be explored separately in the report, there is an inherent interaction between them. First, the role of inter- and transdisciplinarity for curriculum development and research programmes, emphasizing especially the relationship between the humanities and the social sciences on the one hand, and the natural sciences on the other; second, how to build on and promote knowledge that comprises a diverse range of traditions, institutions and epistemologies to promote a truly global knowledge base for the SDGs; and third, the question of how to strengthen the role of HEIs as partners with both private, public and civil society actors in the work with the SDGs. Due to the different levels of abstraction of these core issues, they have been approached with moderately different tones in their relevant sections. Furthermore, the types of conclusions drawn and recommendations provided differ in style.

We recognize and acknowledge the multitude of already ongoing initiatives by international organizations, United Nations agencies and HEIs themselves, working to support the necessary transformations towards the 2030 Agenda. Throughout the report, we have chosen to add boxes with examples to highlight some of these interesting and productive cases of higher education initiatives. The purpose of these boxes is not to suggest them as best practices for all, but rather to illustrate key points and arguments made in the report through examples of what some institutions are doing. In special cases, boxes are also used to add contextual background to the content or call attention to a particular theme.

Beyond disciplinary boundaries for the SDGs

The first theme, on working together with the SDGs, addresses the question of moving towards more inter- and transdisciplinary approaches to education and research. It problematizes the knowledge accumulation logic followed by many HEIs when this leads to overemphasizing theoretical aspects and downplaying practical issues and real-world problems, which are precisely those that the SDGs aim to address. It makes the case for including more problem-based learning and research in HEIs' programmes and activities.

10 https://en.unesco.org/news/unesco-world-higher-education-conference-2022 (Accessed 30 July 2021.)

The report proposes that SDGs should not be mere add-ons to the classic curricula, but embedded as a premise for all education and research. While reward systems and university rankings promote competition and select for high productivity, citations and visibility, HEIs should rather be scored, and then also rated according to their performance on the SDGs. Similarly, selection criteria for positions should also consider merits related to SDGs and societal interactions. A key challenge in doing so is how to promote inter- and transdisciplinarity, which implies gradually giving way to inter- and transdisciplinary approaches to knowledge. Complex problems like the ones the SDGs address require explanations, and later solutions, that demand the convergence of multiple disciplines working together interdisciplinarily and transdisciplinarily. Sustainability is perhaps the best example of a new science where disciplines converge to both understand, and try to face and solve, the complex problems that unsustainable production and consumption create.

Engaging in other ways of knowing

The second theme relates to engaging in other ways of knowing. The report makes a strong case for the need for HEIs in general to open up to multiple and plural views of the world, as well as to very diverse ways of knowing that can add value to strict science-based knowledge, and with a potential for, among other things, explaining and protecting the environment. HEIs should be privileged spaces for epistemological dialogues among diverse views of the world and should show openness to diverse ways of knowing.

In this section, the report argues in favour of making the most of the learning potential in the process of implementing change, where learning can be enhanced when accompanied by research objectives (action research) and when social participants are included in the definition of the need for change and in the research that goes with it (participatory research). Experimental and quasi-experimental interventions have the advantage of allowing for the testing of causal hypotheses that may make way for scaling successful local developments and for influencing public policy.

We propose that the social robustness of solutions developed by HEIs in general be the measure of quality.

Epistemological issues also need revising. Knowledge produced in a diverse range of settings can provide important insights for solving environmental, health, production and social problems locally, and some of this knowledge has been successfully transferred to other contexts and been found to have more universal uses. This is why traditional downplaying, ignoring and discrimination against more diverse ways of knowing should be openly combated, and conversely, HEIs should set an example of openness to other non-hegemonic modes of knowledge production. They should also foster epistemological dialogue as a means towards renewing our questions and finding new ways for seeking answers.

Higher education partnerships

The third theme deals with the need for a more proactive presence of HEIs in general in society and in each of its different sectors: the government, the private sector, civil society, and the social organizations and communities that represent the very diverse sectors of every society and that to different degrees suffer the consequences of inequality and environmental deterioration.

HEIs in general have a strong standing in society and are trusted. However, it is not often that HEIs take advantage of this fact to expand their relationships with the different sectors of societies, attend to their educational needs and learn from their problems and difficulties, as well as from their worldviews. HEIs must build alliances with governments, private enterprises, civil society organizations and local communities, but never at the cost of putting society, or sectors thereof, at risk.

HEIs generate knowledge and train professionals, but not all of them base their research and curricular design on the evolving needs of the societies around them. In response to the call to contribute to the SDGs, HEIs must play a much more dominant role in society as a whole and in

the different sectors that compose it. Knowledge and science should be democratized, and HEIs have an accepted role to play in this process. However, some of the knowledge generated, and much of the education students receive in HEIs, can be translated into policies and intervention projects that involve solutions to problems or potential improvements to well-being and social justice. This involves strengthening the outreach that HEIs already do and directing it towards advocacy for change and transformation, and towards social impact. HEIs have an important role to play in decision-making and a commitment to having a place and a voice in government and society in congruence with their ethical principles. Because they occupy the highest rank in the educational system hierarchy, HEIs in general can play a key role in democratizing quality Education for All, as well as in educating society regarding sustainability and the SDGs.

We are aware of the diversity of HEIs in general, as well as of the diversity of contexts in which they are located, and freely admit that this report will not be able to do this incredible diversity justice. Each HEI must find its own way of responding to this call. We do not mean to dictate solutions, but to open up areas for debate and guide decision-making. We are convinced that HEIs must do this together with governments, civil society, the private sector and with those who suffer most from the problems of our world today.

CHAPTER 2

Beyond disciplinary boundaries for the SDGs

2.1 The change to drive change

We are now facing the global challenge that is the survival of the human species on the planet. While some argue that there were also geological, ecological and human changes in the remote past, this moment in time is distinct: human beings – who to a large extent have provoked it – are still able to reverse current trends. To be able to achieve this goal, changes in the ways that knowledge is generated, circulated and used are needed. But what kind of change?

Among the most powerful tools for this are science and research. We are experiencing paradigmatic changes that may not be widespread but mark out the future and allow us to draw up lines of action. The relationship of science and research with nature and with society has changed, together with the internal structures of many higher education institutions (HEIs). This can be seen as a reaction to the growing insight that individual disciplinary developments alone cannot solve problems that require the understanding of multiple dimensions. This points to the need for epistemological and methodological changes in the ways knowledge is created. The practices of scientific research are changing because 'the closer interaction of science and society signals the emergence of a new kind of science: contextualized, or context-sensitive, science' (Nowotny et al., 2001). The question for science is no longer just what we can do, but what we want and how we can achieve it. Among the central spaces for knowledge production are universities. However, today the need for change is reaching a new velocity as the dialogue between HEIs and society has become more fluid and urgent. The question is how HEIs face new challenges and how they could be more pertinent and avant-garde in their fundamental contribution towards a sustainable society.

Sustainability is a way of understanding life together, living with nature and the environment in a global world:

> Only by following an interdisciplinary approach, sustainable development education will be able to confront "problems that cross traditional disciplines, involve multiple stakeholders, and occur on multiple scales" (Dale & Newman, 2005, p. 353), such as climate change, poverty, and inequalities, acknowledging the interdependence between society and ecosystems. (Annan-Diab and Molinari, 2017, p. 77)

In that sense, sustainability is an objective that is transversal across disciplines, education and professions. However, it is not enough to understand this as merely aggregating discipline-based activities. More than the sum of these parts, it is a way of creating knowledge and educating that is more than this. Such a call for change is not a criticism of the fundamental role disciplines can play in the processes of knowledge production and circulation. Rather, it is an attempt to better understand their achievements and limitations. The change consists of being efficient and effective in determining what the necessary forms of knowledge are, in terms of certain objectives at this particular point in our collective history.

There is a need to reorient existing education programmes to include more aspects related to sustainability and its three pillars – society, environment and economy. 'No one discipline can claim education for sustainable development for its own, but all disciplines can contribute' (UNESCO, 2005, p. 31).

As academics, university authorities and their agents, we consider critical thinking to be one of the main values, and most valuable elements, of universities and HEIs, in addition to the more traditional functions of teaching and research. Critical thinking is central to our dearest shared values, so we must think critically and reflect on our mission and our role within society. We insist that this mission is not linear, that it must move beyond traditional separations between basic and applied knowledge, and that it integrates both thinking about problems and working together towards their solution. In the academic literature, these new forms of knowledge creation have different nomenclatures and definitions. They are the subject of internal polemics. Among the most frequently used concepts are those of multi-, inter- and transdisciplinarity (see Box 1). However, precisely because this process includes not only academics but all members of society, we choose to talk about different forms of 'working together'.

This section of the report responds to the first of the core themes laid out in the introduction: *The role of inter- and transdisciplinarity for curriculum development and research programmes, emphasizing especially the relationship between the humanities and the social sciences on the one hand, and the natural sciences on the other*. It first develops the idea of working together across disciplines and beyond academic boundaries to achieve the Sustainable Development Goals (SDGs), pointing to the rationales for emphasizing novel ways of collaboration and their potential impacts. Building on that, this chapter will lay out some of the core challenges and structural barriers to thinking and working together in both research and education. Finally, some ways forward are outlined, drawing on a range of exemplars and practical illustrations of promising work that is already under way in HEIs all around the world.

Box 1. Multi-, inter- and transdisciplinarity

As recognition has dawned that single disciplines working in isolation will not be able to address complex planetary and societal challenges, diverse practices of 'beyond-discipline' collaboration have evolved. A number of key terms – multidisciplinary, interdisciplinary and transdisciplinary – have been used to describe the varying degrees of interaction and integration involved in these practices, but there remains some ambiguity surrounding how these terms are used and understood (for example, Choi and Pak, 2006). In this report we do not aim to provide clear-cut definitions, but it is important to clarify our own understanding of these terms and – importantly – their differences. We distinguish the terms having regard to the degree of integration, the distribution of power among different actors, and the rationale for collaboration.

Multidisciplinarity brings together knowledge from different disciplines to address a given issue. The process of knowledge production and power relations between disciplines is mostly left unaffected in multidisciplinary collaborations. Each discipline works in a self-contained manner without aiming to transform the disciplines themselves (see Max-Neef, 2005). Compared to inter- and transdisciplinary collaboration, integration – both on an epistemic and social level – is not an objective of multidisciplinarity.

Interdisciplinarity describes a mode of knowledge production that focuses on coordination and interaction between different disciplines as a means to both advance knowledge and action (see Pohl and Hadorn, 2008). In contrast to multidisciplinarity, there is an attempt to integrate scientific practices, including information, data, concepts and theories from more than one discipline (see Committee on Facilitating Interdisciplinary Research, Committee on Science, Engineering and Public Policy, 2004). However, the term has been used to describe a range of ambitions, from cooperation that leaves disciplinary boundaries mostly untouched to collaborative work through which disciplines themselves are transformed (see for example, Barry et al., 2008).

Transdisciplinarity was introduced as an explicit addition to interdisciplinarity to describe collaborations that go beyond coordinating interactions between different disciplines and aim at transcending them, therefore moving beyond disciplinary boundaries. In addition, transdisciplinarity rests on the premise that researchers alone cannot solve these problems, and that therefore academic boundaries also need to be transgressed through the incorporation of extra-academic actors and knowledge into processes of problem-definition, knowledge production and knowledge use. Transdisciplinary collaborations thus aim for both conceptual integration of different disciplines and the transgression of academic boundaries (which is not necessarily a part of interdisciplinary modes of producing knowledge), to include other forms of knowledge. Transdisciplinarity points to a disintegration of boundaries and the development of something entirely different (Nowotny et al., 2003). In highlighting commonality in the rationale for applying one of these approaches, a recent review of inter- and transdisciplinary research shows that despite the crucial differences there are also commonalities, for example the focus on problem-solving in interdisciplinarity and transdisciplinarity (Vienni Baptista et al., 2020).

2.2 Working together for the SDGs

2.2.1 Why is this necessary?

Without a doubt, the complexity of sustainability challenges and the interconnected nature of the SDGs means that thinking and working together (collaborating, for brevity) is essential if challenges are to be overcome and goals met (Herzig Van Wees et al., 2019; Bolger, 2021). This will require both specialized insights and collaboratively generated knowledge across traditional disciplinary boundaries (Bursztyn and Drummond, 2014; SDSN Australia/Pacific, 2017). More than this, collaboration partners must be willing and able to overcome prevailing assumptions about the relative value of contributions from different disciplines and challenge incumbent forms of power and privilege that run counter to the SDGs. Given the challenges inherent in such collaborative endeavours, and the diversity of roles and remits that HEIs hold within specific contexts, it is likely to be those HEIs that are able to commit time and resources to collaborative activities that will be able to advance interdisciplinary thinking and doing for the 2030 Agenda and support cross-sectoral implementation of the SDGs (El-Jardali et al., 2018).

Within HEIs, discussions abound regarding the best way to activate collaboration for sustainability and the structure that such collaboration could and should take. These are often allied to broader debates about the future form and function of HEIs, with calls for a shift away from the era of specialization typified by universities in the twentieth century, towards the creation of more interdisciplinary spaces. However, rather than a linear shift from one state to another, Mazzocchi (2019) maintains that dual trends within the university sector are discernible with evidence of increasing specialization and working across disciplinary boundaries operating in parallel. As shown in Box 1, there are some established terms for articulating different forms of collaborative activity – multidisciplinary, interdisciplinary and transdisciplinary – which involve different actors and embody different power relationships between them.

According to Vienni Baptista et al. (2019), in addition to the generic desire to improve understanding of systems, collaboration across disciplines also has philosophical, instrumental, and critical drivers which can lead to the radical system change required to achieve the SDGs. From a philosophical perspective there is a desire to transcend the narrowness that a single-discipline perspective can generate. An instrumental justification for collaborative activity focuses on the need to solve existing societal challenges that are embedded in complex adaptive systems, while a critical argument for collaboration seeks to challenge underlying assumptions and power dynamics in existing systems of knowledge production.

2.2.2 What is the impact of collaborating for the SDGs?

Certainly, research has found that greater accountability and ethical oversight can be generated in collaborative settings, with indications that innovation capacity can also be elevated by 'better understanding societal needs and more thoroughgoing efforts to transform research practice, problems and relationships' (Vienni Baptista et al., 2020, p. 5). There are, however, certain criteria to be met for collaborative activity to function optimally, and HEIs vary in terms of their histories, cultures, and socio-economic mandates. As a result, there needs to be acceptance of, and respect for, different theories, methods and forms of knowledge that diverse disciplines identify, create, and utilize, and for collaboration that ensures equal participation and contribution between actors. This important issue is considered in depth in Chapter 3, flagging the unequal patterns of power and privilege between and beyond disciplines. Prejudice and misconceptions, among both researchers and policy-makers, can work against greater diversity of disciplines in collaborative research (Spaapen et al., 2020) and teaching initiatives. For example, research in Europe has indicated that the arts, humanities, and social sciences (AHSS) need to be involved more deeply in collaborative activities

within HEIs. The European Federation of Academies of Sciences and Humanities (ALLEA, 2019) also found that a technocratic and instrumental attitude towards societal challenges, reflected in the language of Horizon 2020 funding calls within Europe, had discouraged greater involvement from AHSS researchers. So, radical interdisciplinarity (as collaborative work involving AHSS and other disciplines is sometimes called), requires going beyond a problem-solving approach to achieving the SDGs (Vienni Baptista et al., 2020, p. 4), to incorporate critical, even transgressive approaches and motives.

Radical interdisciplinarity may include challenging current narratives or bringing historical or contextual perspectives to bear on present conditions. Essentially, it is argued that opening up challenges presented by the SDGs to interrogation and critique, and allowing them to be approached from novel angles, has the potential to widen participation and the degree of innovation of the resulting responses. Such engagement of diverse disciplines needs to be embedded within HEI systems. It needs to take place across research and teaching lifecycles, from programme design to impact evaluation. Such arguments for widening disciplinary participation in collaborative research and teaching have been made before, however, with limited impact. In the following subsection, reasons why diversification has not occurred are examined in detail.

2.2.3 Moving from agreement to action

While there is general agreement about the need for thinking and working together for the SDGs within the HEI sector, there is less agreement about how that collaborative activity could and should take place. In addition, there is a gamut of context-specific challenges to overcome, both profound and mundane, even if agreement can be secured that action should be taken. Undoubtedly, responding to these challenges will require substantive change. Additional time, resources and investment will be required, as will a cultural change in mindsets in academia and beyond, and an open dialogue between participants. There is also space for HEIs to play a significant role in extending collaborative partnerships with each other and with other stakeholders engaged in the 2030 Agenda, including governments and communities. The nature and value of partnerships beyond HEIs are addressed explicitly in Chapter 4 of this report, as relations within partnerships can take a variety of forms, from unequal partnerships where one partner occupies a subordinate role, to symmetrical collaborations, to mutually challenging relationships committed to more radical shifts in knowledge production practices through such collaboration (Barry and Born, 2013). Before exploring the importance of equal partnerships, it is important to outline the range of challenges that can occur when expanding collaborative thinking and doing by HEIs in relation to achieving the SDGs. Underpinning this challenge matrix is the recognition that universities and, more generally, HEIs operate in different contexts, and are diverse in size and structure, focus and resourcing. In addition, while the specific challenges of research and teaching are considered separately in the next section, these activities often interact.

2.3 Challenges of working together for the SDGs

2.3.1 Research

Although there seems to be wide consensus among HEI faculty members on the importance of interdisciplinary research and teaching, and more institutions for interdisciplinary research and teaching have been established within HEIs, additional efforts are needed to educate graduate students in those 'problem areas' that attract faculty members across different disciplines. New administrative tools have been provided by government agencies in recent years for enhancing interdisciplinary research and teaching, but there are still serious challenges to interdisciplinary research and teaching on HEI campuses.

Deep tensions between disciplines with different 'paradigms'

The fact that HEIs organize their teaching and research on the basis of 'disciplines' is a result of the development of sciences as 'normal sciences' defined by different 'paradigms' in Thomas Kuhn's (1962) words, so it is only natural for different branches of scientific knowledge to offer different ways of understanding the world, thus making it difficult for scientists from these disciplines to communicate with other disciplines (Kuhn, 1995). While it is true that major steps in scientific development are marked by 'crises' and 'revolutions' in the history of science, characterized by breaking down the borders between different 'normal sciences', these 'border-breaking' events are traditionally considered as achievements to be appreciated rather than goals to be pursued. In order for researchers and professors in different disciplines to think and work together, they should strive to reach a deeper and broader understanding of the problems they are supposed to address together than could possibly be achieved on the basis of their respective disciplines separately, or even jointly.

Training and practices

There are challenges that relate to the relationship between how scientists or scholars are trained, and how they work. On the one hand, how a scientist enjoys their scientific activities depends very much on how they were trained in preparing their scientific career; on the other hand, how future scientists are trained depends on how their teachers as mature scientists conduct their research and teaching. Most scientists are used to working within the fields in which they were trained, and their students in turn will also be used to working within the fields in which their teachers now feel most comfortable working. There is a particular role for scholars in the humanities such as philosophy, history, the arts and literature in collaborative efforts towards the SDGs, as expertise in these disciplines is especially important in collectively addressing the comprehensive, complex and, in a sense, 'wicked' problems the goals address.

Motivations and incentives

There are challenges in terms of the relationship between how a HEI faculty is motivated to work and how this kind of motivation is nurtured and encouraged by HEI leaders. How a university member is motivated depends on the way academic activities are organized in their institution, and administrators in turn need support from faculty members in introducing and implementing new ways of organizing research and teaching. It is not easy for faculty members to support a radically new policy introduced by HEI leaders that departs from the mentality that has been nurtured and encouraged in the past.

Faculty specialization and insecurity

The promotion and tenure process that historically favours specialized study poses a series of hurdles for inter- and transdisciplinary approaches, as the professional advancement of faculty is tied to specialized and discipline-specific work, and individual faculty accomplishments are rewarded ahead of collaborative efforts. This reinforces silos and precludes interdisciplinary collaboration in research and scholarship.

The massive restructuring of higher education has led to an increase in part-time faculty, or adjunctification (American Federation of Teachers, 2020), whose employment is insecure and under-remunerated, resulting in a revolving door of faculty. However, adjunctification has the potential to be positive. For example, it allows faculty in high-income countries to pursue a career in their country and contribute to education on specific topics in low- and middle-income countries. HEI leadership must advocate for faculty working across the disciplines, and better working conditions for those who are employed on a short-term contractual basis. In order for such advocacy to be effective it must eventually be institutionalized, centrally endorsed and formalized in university policy and faculty handbooks, as well as at a grass-roots level in the form of college by-laws or unit-based Promotion and Tenure documents.

Framing

There are challenges in terms of the relationship between intellectual activities that are oriented towards what has been referred to as *problem-solving* and those that are oriented towards *truth-seeking*. Generally speaking, science and research that follow a logic that is truth-oriented are more often motivated by personal curiosity and free thinking, whereas problem-oriented research is related to ideals of social responsibility and sponsored inquiry. It is very important to bring together these two types of intellectual activities, so that problem-oriented intellectual activities can be solidly supported by truth-oriented activities, and truth-oriented activities can be critically or constructively enhanced by problem-oriented activities. The major intellectual and organizational challenge in organizing interdisciplinary research and teaching is, therefore, how to develop a complementary rather than confrontational relationship between these two types of intellectual activities. More importantly, it is crucial to be attentive to the fact that knowledge production (and higher education) is diverse in its aims and (perceived) purposes, and that it is important not to be content with neat dichotomies but rather aim to move beyond such distinctions and compartmentalization.

Higher education institutions in society

There are challenges in terms of the relationship between HEIs and society at large in assessing the value of academic work. How HEIs and their faculty members are treated and how their performance and achievements are valued in society at large depends on the prevailing value standards; but these value standards should in turn be improved by HEIs and their faculty members, especially when higher education has entered the expansion phase. In order to establish a virtuous rather than a vicious circle between society at large and HEIs in terms of their role in implementing the SDGs, both public and government should give due recognition to the value of what is achieved by the collaborative efforts of HEIs in promoting the SDGs. Ranking and assessment of HEIs in general, and their individual fields and disciplines in particular, especially those recognized by governmental and non-governmental sponsors, very often function as an incentive for university operations.

One telling example of this comes from China, where in October 2020 top leadership issued a comprehensive policy document for intensifying the reform of educational assessments, covering almost every aspect of government-run formal education. At one point the document makes explicit reference to the SDGs, relating them to educational assessments through the requirement to 'actively carry out international cooperation in education evaluation, participate in the monitoring and evaluation of the implementation of the educational part of the United Nations 2030 Agenda for Sustainable Development Goals, and thereby to display Chinese concepts, and contribute to Chinese solutions' (Xinhua News Agency, 2020). The document mentions only assessment of the performance of educators and educational agencies concerning the educational part of the SDGs, but not the role that education in general, and higher education in particular, plays in promoting the SDGs. A more comprehensive understanding of the connection between HEIs and SDGs is obviously very important.

Teaching and research

There are challenges in terms of the relationship between what is taught and what is researched

in HEIs. Teaching is typically concerned with widely accepted scientific discoveries, but research in universities is meant to challenge old ideas and explore new ones. This contrast makes it difficult for the latest achievements of established disciplines to be taught in classrooms; it is obviously even more difficult for the latest achievements of interdisciplinary research to be taught in classrooms, and hence for students to be well trained for future interdisciplinary research.

2.3.2 Teaching and curriculum

The challenges and changes laid out at the beginning of this chapter are reflected in the new course offerings by front-running HEIs, and in new league tables of HEIs.[11] Some HEIs have begun emphasizing in their advertisements that their new education course offerings and learning experiences are interdisciplinary and holistic. Preparing students for the new normal post-COVID-19 world includes nurturing skills and mental capacity for active learning, curiosity, and mental stress tolerance, as well as being able to synthesize broad knowledge and cocreate sustainability solutions.

Yet 'sustainability' is still not thoroughly implemented in the strategic plans of many HEIs. Even among those that self-report in order to be measured on their sustainability performance in the AASHE index,[12] [13] only two thirds have earned platinum, gold, silver or bronze STARS (Ramakrishna et al., 2021). Why is this so? What needs to be done to overcome the obstacles to progress on the needed transformation of HEIs?

The growth imperative

One potential answer lies in the fact that most of the countries around the world have placed economic growth as the primary policy goal during the past decades. The country or community's social, environmental and sustainability dimensions have been systematically relegated. Moreover, job opportunities and wealth accumulation have become the priorities of most students and their families. Taking the cue from stakeholders, HEIs aligned degree programmes and course offerings more closely with the perceived job opportunities and economic opportunities (Ramakrishna et al., 2021). Industry relevance is given the strongest emphasis. Faculty members were recruited and incentivized accordingly. Hence, most faculty members do not have a strong foundation in, or knowledge of, sustainability principles and solutions. Moreover, they are given few or no opportunities by the respective HEIs and national funding agencies, who have prioritized narrowly focused economic growth objectives and goals. Besides, the HEIs have grown in scale and a broad range of course offerings has emerged due to the push for mass higher education worldwide. Leaders of HEIs have reinforced rigid disciplinary boundaries for ease of management, cost controls, and differentiated course fees. Over the decades, these discipline-based frameworks and approaches to managing academic units have fed on themselves and led to self-serving subcultures and academic processes.

Sustainability as peripheral to core business

There are a number of other reasons for inertia or inaction by the HEIs. One prevailing view is that sustainability and the SDGs are not the core business of HEIs, but an agenda for governments, businesses and consumers. HEIs around the world find it hard to precisely define curricula, especially when there is pressure for them to be framed in terms of potential future job opportunities. Moreover, the multiple articulations of sustainability thus far are often perceived as broad vision statements and goals that lack sufficient detail for building or repositioning the respective curricula of academic programmes and organizational units. There is also general inertia around making changes before clarity exists about the scale of jobs available for all the sustainability-focused graduates.

11 https://www.timeshighereducation.com/impact-rankings-2020-methodology (Accessed 26 July 2021.)

12 https://stars.aashe.org/about-stars/ (Accessed 26 July 2021.)
https://reports.aashe.org/institutions/participants-and-reports/ (Accessed 26 July 2021.)

13 Note that Times Higher Education (THE) also introduced an impact ranking system in 2019 to assess universities' performance against the SDGs in four categories, namely teaching, research, outreach, and stewardship. For more information see https://www.timeshighereducation.com/rankings/impact/2021/reducing-inequalities#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/undefined (Accessed 29 July 2021).

Diversity of higher education institutions

HEIs are diverse in terms of comprehensiveness, resources, talents, scale and mandate. Some HEIs are highly specialized whereas others are more comprehensive in terms of their range of disciplines. Impactful sustainability education demands interdisciplinary and transdisciplinary treatment of subjects and projects, thus compromising the ability of narrowly focused HEIs to deliver on such requirements. Some institutions are focused primarily on undergraduate education, with limited involvement in graduate education and scientific research. They are less equipped than research-intensive universities or postgraduate universities that are able to integrate cutting-edge knowledge into their sustainability education programmes and learning experiences. According to the World Higher Education Database,[14] of the 20,000 HEIs worldwide[15] only a small fraction have adequate resources to adapt their academic programmes and infrastructure to the deeper aspects of sustainability education, research and solutions. In other words, a majority of the HEIs are unable to match the requirements of sustainability's vision and goals with adequate talent and expertise.

The inertia of higher education institution structures

In general, curriculum changes in HEIs are often associated with cumbersome and lengthy approval processes. Academic units (departments and faculties, schools and colleges) are resourced and incentivized based on student numbers and their full-time equivalents (FTEs). In other words, leaders of each academic unit fight very hard to retain and grow FTEs. This means less attention is given to subjects taught by faculty members from other academic units, or to co-teaching by them. The rigid academic units and disciplinary structures of HEIs can cause resistance to change. In the case of affiliated HEIs, it is even harder for them to make any changes to their curriculum, pedagogy and student assessment systems. In the case of professional degrees, any changes to the curriculum and degree programmes have to be reviewed and endorsed by the professional accreditation bodies and societies, which tend to be national as well as international. These accreditation exercises are scheduled at intervals of three to five years, thus imposing limitations on the speed of changes the HEIs might like to make. Professional bodies have diverse standards and criteria. In other words, HEI faculty members and academic leaders have to educate them and persuade them of the need for changes and the usefulness of educational outcomes in terms of graduates' futures.

Crowded curriculum

Stricter requirements in core disciplines often do not allow for substantial changes in the curriculum. The existing curriculum is often crowded with different subjects, modules or courses offered by individual academic units. An even more challenging hurdle is the lack of an institutionalized incentive system for implementing changes and transitioning into new areas. In the case of research-oriented universities, faculty members tend to teach subjects close to their own research areas. Annual assessments, promotion and tenure processes, and award and reward selection processes favour, and mostly encourage, narrowly focused monodisciplinary work by the individual faculty member. This causes a systemic, inbuilt inertia that keeps faculty members from transitioning to interdisciplinary and transdisciplinary pursuits. Many HEIs suffer from excessive governance and bureaucratic layers in the name of strengths, weaknesses, opportunities, and threats (SWOT) analysis, risk assessments, and mitigation measures. In some cases, academic leaders are chosen or appointed for fixed or limited terms, and thus they are less incentivized to radically change or upset the status quo. This situation contributes to a risk-averse culture on the part of all HEI stakeholders, and can result in students being discouraged from pursuing transdisciplinary degree programmes and subjects.

14 https://www.whed.net/home.php (Accessed 29 July 2021.)

15 This number does not include all private for-profit institutions, newer/young institutions, and institutions that may not be officially recognized by the higher education system in their country. We acknowledge that it is difficult to determine the exact number of HEIs due to their diversity.

Training for teachers

Most HEIs around the world do not have adequate training methods to introduce and empower faculty members with improved pedagogical methods and teaching tools. They need further training and new methods of student engagement to embark on, and appreciate, collaborative teaching with experts from other disciplines in delivering sustainability and SDG-related education and learning. This is accentuated by the lack, or short supply, of quality, relevant teaching textbooks related to sustainability, which is often viewed as very broad-based with no core set of principles that can be imparted to the students. Moreover, faculty members themselves need resources, content, time and retraining opportunities to teach and keep up to date with state-of-the-art as well as emerging sustainability-related knowledge and skills. Often, they themselves need to develop the skills, talent and motivation to engage and work with and beyond HEI agents such as society, community organizations, policy-makers, businesses and industry required by the nature of sustainability education, research and service. Such processes are time-consuming and require faculty members to work outside the traditional comfort zones of their respective academic units.

Part of the solution is the priority accorded to sustainability by HEI leaders. If they hold sustainability in high regard, then the rank and file will follow suit and make things happen. Embracing the unknown or undefined is structurally hard for HEI leaders and academics, due to governance systems that are not aligned with the particular needs of each institution, especially when it comes to establishing modes of teaching the knowledge and skills necessary for productively working together across disciplines and academic boundaries. Different HEI ecosystems or contexts require diverse, customized approaches to sustainability education and also pedagogy. Moreover, deeper collaboration and partnerships among the nation's academic, civil society and economic sectors are needed for progress towards sustainability education and the generation and implementation of solutions (this is elaborated on in further detail in Chapter 4 of this report). Academic leaders need to focus on designing and developing new and creative sustainability education programmes that are fundamentally and radically different from the current established practices. This requires deeper and stronger collaboration among faculty members from diverse disciplines and with diverse expertise. HEI leaders need to rethink and create inspiring collaborative spaces in which teams can come together and gel with new ideas for sustainability learning and research.

Sustainability challenges are real, and there is a global shortage of suitably trained talent around the world. Higher education needs to be reimagined or redesigned with sustainability in mind. Fortunately, there is a growing number of (online) courses which all HEIs around the world can leverage as they build their own ecosystems. It is time for the HEIs to make sustainability and SDG literacy a core requisite for all faculty members and students. Sustainability education at its core exposes students to real-world problems and immersive learning and research experiences. Appreciating the greater good of people and planet, and contributing to values beyond mere monetary gain will further enthuse and inspire students as well as faculty mentors. Ultimately, the education culture at the HEIs needs to change so that it encourages students to learn via experimentation and critical thinking from multiple perspectives. HEIs need to increase efforts to encourage young minds to take up sustainability education and careers, and to continue to effectively communicate the immense benefits of sustainability in terms of economic growth, human well-being and a healthy planet Earth.

Embracing sustainability is about enabling graduates to be future-ready, and giving them a deeper sense of contemporary challenges in their future lives. Progressive and timely efforts by all higher education stakeholders can help to promote the well-being of graduates as well as planet Earth. While the challenges are complex and interrelated, there are ways forward to address them, as discussed in the following section.

2.4 Ways forward

Despite the challenges outlined above, there are opportunities for HEIs to move forward productively in their contributions to achieving the SDGs. There is no single route for all HEIs here; the pathways to be taken will depend on the starting position of HEIs and their role and remit in given contexts. Nonetheless, all pathways will involve developing the means to build on and promote knowledge that comprises a diverse range of traditions, institutions and epistemologies to promote a truly global knowledge base for the SDGs. Similarly, there are general principles around the public value of science[16] and open science (UNESCO, 2021) that will support global progression in relation to the 2030 Agenda.

In addition, the global COVID-19 pandemic, for all its devastation, presents a partially open – but rapidly closing – window of opportunity for catalysing change in relation to sustainability (United Nations, 2020). The pandemic has crystallized both the challenges and benefits of working together for a safe and sustainable world. It has created a new appetite for collaborative activities, with the crisis making sustainability (or more commonly, unsustainability) more obvious to people in their day-to-day lives.

This section examines some of the opportunities that exist for HEIs to make the SDGs and the 2030 Agenda central to their operations and actions and bridge silos within and between research and teaching (and research-led teaching), and for HEIs to productively use their status as a substantial institutional actor within societies. It illustrates these opportunities with case studies from diverse contexts.

Opportunities exist for HEIs to develop and promote knowledge and practice that comprises equitable and collaborative activities from a diverse range of traditions, institutions, and epistemologies in order to build a truly global knowledge base for the SDGs. As there can be considerable inertia inherent in HEI structures, particularly those with long histories and established positions within educational infrastructures, this may require the development of explicit **intellectual frameworks** for collaborative research and practice and deliberate interventions to support the kinds of radical interdisciplinarity and transdisciplinarity needed to meet the complex challenges of sustainability (see Box 2).

Incentives and support for research need to be reoriented to encourage researchers to engage in equitable and collaborative SDG-related research. This can range from systemic measures to improve literacy around the SDGs throughout HEIs, to specific training for collaborative research across the academic lifetime. Allied to developing intellectual frameworks for collaborative research, indicators and performance assessments need to be recalibrated with collaborative research in mind, and data collection systems need to be developed or upgraded in order to account correctly for the impacts such research creates. Externally driven ranking systems of HEIs, for example, should be revised in order not to penalize collaborative researchers or government agencies that can play a key role in developing and implementing specific policies for HEIs to promote collaborative research for the SDGs.

New levels of **integration** are required between those collaborating, from science, technology and engineering disciplines through to the arts, humanities and social sciences. Skilled integrators will be required with specific integration competencies that are as yet underdeveloped and poorly rewarded in many HEI settings. HEIs, supported by funding agencies and others, need to invest in this integration space. Leal Filho et al. (2020) propose that, to extend integration capacities, some universities use their potential to create living labs for the SDGs where such integration can take place within a protected setting (see Box 3). In addition to the capacity to engage in integrative research for the SDGs and to provide investment and protected niches for

16 As the International Science Council notes, scientific knowledge, data and expertise must be universally accessible and its benefits universally shared. The practice of science must be inclusive and equitable, also in opportunities for scientific education and capacity development (International Science Council, 2019).

emergent activities, it is clear that **leadership in relation to collaborative working at all levels** will be essential (Purcell et al., 2019), irrespective of the different ways in which universities might work towards delivering the SDGs. Similarly, Blasco et al. (2021), drawing on their analysis of Spanish public universities, conclude that embracing structural and cultural changes which place SDGs at the core of governance and management of the university is a crucial means for increasing the impact and success of activities.

Box 2. Intellectual frameworks for collaborative research: Federal University of ABC

The Federal University of ABC (UFABC) in Brazil was established in 2006. As a new university it was able to create its structures from the foundations up, unencumbered by the relics of past decisions and traditions. From this blank sheet, UFABC was designed with an innovative interdisciplinary pedagogical plan. There are no departments, and the university explicitly seeks to foster interaction between academic members from different backgrounds.

The reasoning behind creating such an open framework for collaborative research is that such interdisciplinarity contributes to academic excellence, which is in turn seen as a condition for social inclusion. Excellence is a fundamental characteristic to be fostered at UFABC, which aims to achieve high levels of quality in teaching, research and outreach. Strategic research units were created to contribute to the full implementation of the University's education programme. The activities developed by these units ensure their projects are innovative in nature, through cooperation and interdisciplinary integration between the different centres and other bodies of the UFABC, promoting knowledge in specific areas.

One example is the Strategic Unit for Strategic Studies in Democracy, Development and Sustainability. The initiative brings together professors and researchers from diverse academic units at UFABC, representing six undergraduate courses (International Relations, Economic Sciences, Public Policy, Territorial Planning, Environmental and Urban Engineering and Biology), and four postgraduate programmes (Humanities and Social Sciences, Territory Planning and Management, Public Policy, Environmental Science and Technology). The strategic objectives of this Unit are to propose and produce, based on an interdisciplinary approach, teaching, research and extension on the themes of democracy, development and sustainability. Objectives include: mapping the current state of the main issues – empirical and theoretical – to be addressed in the three themes across territorial scales; assessing interdependencies, constraints and possible fields of intervention on these issues at different scales; and improving and proposing guidelines for policies geared to greater social, economic, political and environmental efficiency and equity (https://www.ufabc.edu.br/en/).

Box 3. Integration for collaboration: Utrecht University

Utrecht University in The Netherlands explicitly makes it its mission to work collaboratively with and through the SDGs to achieve a better world. In line with this mission, in 2016 the University placed sustainability at the heart of its core tasks of education and research and its business operations, explicitly branding itself 'a sustainable university'.

Utrecht University has created spaces for integrative research, through discussion and scholarship, to foster invention, inspiration and community spirit, and aims to be a 'safe place for a meeting of minds, both from within the university and beyond' (Pathways to Sustainability, n.d.). The integrative strengths illustrated by Utrecht University are evidenced by the more than 1,200 academics brought together within the Pathways to Sustainability strategic theme and who are working together on responses to the climate crisis and biodiversity loss through 13 research institutes. They include diverse disciplines from law and planning to Earth sciences and economics, and draw on expertise from the Copernicus Institute for Sustainable Development and the Urban Futures Studio to explore pathways to just and sustainable futures for all.

Pathways to Sustainability advances innovative research via selected thematic areas. The focus in 2021 is on identifying and understanding transformative pathways in five hubs: Future Food Utrecht; Towards negative emissions; Transforming cities; Water, climate and future deltas; and Towards a circular economy and society.

The University sees itself as an agent of change for sustainability and has adopted a 'living lab' approach integrating its key roles of research, education and business operations and providing spaces where researchers, students and managers work together to find solutions for a sustainable campus and, by extension, society (https://www.uu.nl/en/research/sustainability/research).

HEIs need to **incorporate collaborative working towards the SDGs as part of their teaching programmes**, in a manner that goes beyond creating mere add-ons to their existing discipline-based curricula. Instead, HEIs should seek to highlight and enhance the articulation between the curriculum and the latent social and environmental issues of our time, both locally and globally, to give students the opportunity of becoming global citizens who will be able to contribute productively to the construction of new realities, starting from knowledge, skills and attitudes (see for example Boxes 4 and 5). There is also a need to increase student voices to achieve transformative approaches – students are, after all, central parts of the educational process, not merely passive recipients.[17]

HEIs – besides their function as producers of new knowledge, teaching and community engagement – also play an important and relevant role in engaging with society to achieve the 17 SDGs. To highlight this function, Purcell et al. (2019) describe universities as engines of transformational sustainability towards the SDGs. The aim of higher education therefore must be not only teaching textbook knowledge, but 'providing future graduates with the necessary competencies to initiate the change towards a more sustainable society' (Leal Filho et al., 2020, p. 201).

17 For more information, see Mitra, 2004; Fielding, 2004; Seale, 2009; Lehtomäki et al., 2016; and Kim, 2020.

Box 4. Tsinghua University supports its SDG-focused 'Global Strategy' with its interdisciplinary-oriented reform programme

In April 2016, Tsinghua University announced the launch of a programme reforming its organization and management of scientific research, aiming particularly to promote 'interdisciplinary teaching and research', 'integration of military-civilian researches', 'systematic efforts for frontier researches', and 'application-oriented translation of scientific and technological achievements' (Tsinghua News Network, 2017).

In July 2016 Tsinghua University launched its 'Global Strategy', aiming to fulfil its mission in implementing the SDGs as a university through four identified functions of universities: teaching, research, societal service and cultural transitions (Tsinghua News Network, 2021).

As a result of the University's policies and measures of promoting teaching and research across conventionally defined disciplines, Tsinghua University moves ahead of other universities in China in playing a role in implementing the SDGs that only universities can play. As of 2020, Tsinghua University has 410 SDG-related research institutions, and in that year its faculty and students conducted 9,253 SDG-related research projects, leading to more than 10,000 patents and 494 cases of successful practical application of scientific and technological achievements. In implementing a national goal to peak carbon dioxide emissions by 2030 and achieve carbon neutrality by 2060, for example, a team at Tsinghua University has developed key technology in the form of the high-resolution emission inventory of regional air pollution sources, on the basis of which a national three-kilometre high-precision grid inventory is formed through a large number of industrial point sources, traffic line sources, and agricultural non-point sources across the country through multiple-dimension and multiscale coupling technologies. In 2020 the university opened 1,151 SDG-related undergraduate courses, 1,166 SDG-related graduate courses, held thousands of SDG-related student activities, and organized 408 SDG-related social training programmes.

Tsinghua University established the Institute for Sustainable Development Goals (Tsinghua University, or TUSDG) in April 2017, and, together with the University of Geneva, started a dual master's degree programme on Public Policy for Sustainable Development and the SDGs Open Training Camp, aiming to cultivate high-level talent for promoting SDGs at the global level. Amid the COVID-19 pandemic, Tsinghua University established the Vanke School of Public Health to address challenges in the area that will require governments to work together to improve public health and reform health care systems, placing emphasis on collaborations that transcend academic boundaries (Tsinghua News Network, 2021).

Box 5. Example of Educational Model at Universidad Autónoma de Chihuahua, Mexico

The following is a description of an attempt at transforming the structure of a public university in Mexico in order to align the study programmes with the SDGs. It was put in practice for a year and a half (second term of 2020 to second term of 2021). It was interrupted in November of 2021 due to internal conflicts and difficulties overcoming structural and cultural barriers. We include it as an example of a pertinent innovation that was designed seeking to educate students to contribute to the solution of problems such as those addressed by the SDGs.

In recognition of the strategic role of HEIs in working towards sustainable development (Universidad Autónoma de Chihuahua, n.d.), the *Universidad Autónoma de Chihuahua* (UACH) developed a new educational model that heavily promotes inter- and transdisciplinarity through its training schemes, which focus on societal challenges and contributions to global development and the betterment of society. Through a humanistic and competency-based approach, this educational model, called *Modelo Educativo para el desarrollo sostenible* (UACH-DS), takes into account innovation, design, undertakings and acts for sustainability (IDEAS Transformadoras) (https://renovacion.uach.mx/). The study divisions under this model are ordered in such a way that collaborative approaches to academic work are prioritized, crossing disciplinary and professional boundaries. Such interdisciplinary approaches to divisional training are part of the preliminary approach to the professional world and allow for training and competency development rooted in the emerging problems of society (https://renovacion.uach.mx/formacion-divisional/).

The central study divisions developed at UACH include: Accounting, Administration and Economics for Social Development; Philosophy, Arts and Humanities; Matter, Energy and its Transformation; Health and Human Welfare; Society, Justice and the Rule of Law; Sustainability and Food Security (Universidad Autónoma de Chihuahua, 2019, p. 32). These study divisions have been linked with university competencies (in the form of learning units), as well as transversal competencies in order to provide students with the tools to work in a variety of fields of knowledge.

In the first cycle (two semesters), students are expected to take at least two learning units for each of the six university competencies, and at least one for each of the university's divisions of studies. This design aims to allow students to build up their competencies and develop their abilities to explore and engage with the world's complexities (Universidad Autónoma de Chihuahua, 2019, p. 32). The second cycle allows students to focus their competency development within one division of studies, however, this still occurs in interaction with the other study divisions (Universidad Autónoma de Chihuahua, 2019, p. 32). While students specialize for particular professions as they continue in the cycles, engagement with other areas of knowledge is a consistent component of this educational model, as is consideration of social, economic, cultural and natural environments.

Furthermore, each of the study divisions within this model are explicitly linked to the 17 SDGs. For example, the Studies in Society, Justice and the Rule of Law is linked with SDG 5 on gender equality; SDG 10 on reduced inequalities; SDG 11 on sustainable cities and communities; SDG 16 on peace, justice and strong institutions; and SDG 17 on partnerships for the goals (Universidad Autónoma de Chihuahua, 2020). Through this direct linking, the model identifies the specific competencies to foster within its students via the education provided in each of these divisions.

Through its interdisciplinary approach and the direct linking of its study divisions with the SDGs, this educational model shows how to engage in working together within HEI settings through collaboration across disciplines. It promotes the importance of collaborative practice by encouraging its students to engage with real societal problems, and preparing them with the range of knowledge and tools to address some of the world's greatest challenges.

CHAPTER 3

Ways of knowing

3.1 Diversity and uniformity in higher education

Diverse cultures possess different stores of knowledge, perspectives on the world and languages through which to express that understanding, across continents with their distinct countries, localities and communities. Differing world views can be seen in the relationship between humans and nature – whether this is one of separation or unity, and whether it aims at control or harmony – and between human beings, in their conceptions of community, power, distribution of resources and justice. Even within particular cultures, there are diverse views on the nature of reality and how human beings might apprehend it. Yet these other ways of knowledge and of creating meaning are rarely represented in higher education institution (HEI) settings.

The mainstream structure of academic knowledge, through disciplines, has been highly successful in generating predictive knowledge through which technologies can be developed. The HEIs which are now the primary locus for the development and learning of that knowledge are among the most valuable of our contemporary institutions, providing an essential space for deepening our understanding of the world and for personal and societal transformation. Yet in order to maintain this role in the context of an increasingly interconnected world, HEIs must be open to diverse ways of knowing, expanding the epistemic space to include both mainstream Western knowledge[18] and other forms. Not being inclusive of diverse knowledge systems is leaving valuable knowledge 'on the cutting room floor' and leading to less rigorous and sustainable outcomes. Greater engagement and dialogue with diverse communities will strengthen HEIs' capacity to build global knowledge for sustainability.

Throughout history there have been processes of diversification and homogenization of language, culture and knowledge. With the emergence of empires in different regions of the world, the cultural forms of the metropolis were spread through the vassal states, though with varying levels of imposition of uniformity. In some cases, the lingua franca has been adopted voluntarily to ease trade and scholarly communication. Yet the period of European colonization from the sixteenth century led to the forced undermining of language and knowledge traditions in the Americas, Africa and to some extent Asia, and the consolidation of the nation state in the modern period led to the imposition of national languages and the undermining of local cultures throughout the world. In the contemporary era, the dynamics of globalization, with increasing circulation of ideas through information and communications technology, travel and trade has intensified the processes of homogenization, particularly through the spread of the English language.

The geopolitical movements outlined above have led to the direct loss of cultural traditions, but also entrenched discursive hierarchies, through which minority or marginalized communities lose confidence in the value of their distinct knowledge forms. The spread of formal education has exacerbated these divides. Schools and HEIs have rarely provided spaces for diversity of knowledge forms, in most cases being used as instruments of nation-building, encouraging uniformity of language and culture, and relegating alternative knowledge forms to the village or home. This historical context has made it highly challenging to achieve epistemic pluralism, given the low status accorded to alternative knowledge forms, and the loss of confidence in their value even among the communities that hold them.

In this section we address these challenges, responding to the second of the key questions posed by the report: *How to build on and promote knowledge that comprises a diverse range of traditions, institutions and epistemologies to promote a truly global knowledge base for the SDGs.* Through the section we address the different ways in which

18 Throughout this chapter we will refer to 'Western' knowledge or systems. We use this geographical term as shorthand to describe particular epistemic, institutional and also moral orderings. The term is used to draw a distinction with Indigenous ways of knowing, and also where we argue against the homogenization of scientific research and higher education. We acknowledge that, while it originated in the classical world of Ancient Greece and Rome, what we think of and understand as 'Western culture' drew on many influences from outside, including from the Middle East and India, among others. We are aware that the term 'Western' is itself ambiguous and has a tendency to mask crucial distinctions and specificities. Wherever possible and necessary we will therefore provide more specific clarification.

we might understand knowledge diversity or epistemic pluralism, the rationales for incorporating it in HEIs and its relevance for the Sustainable Development Goals (SDGs), its manifestations in practice and implications for the changes needed in higher education. In this, we acknowledge multiple crossovers with the other two key topics of interdisciplinarity (Chapter 2) and the relationship between HEIs and society (Chapter 4), as well as the recommendations of recent reports, such as UNESCO IESALC's (2021) recent work on the Futures of Higher Education.

This section takes as its starting point that mainstream academic knowledge has many merits, but should not assert an exclusive claim, or relegate other ways of knowledge to irrelevance or the merely exotic. Instead, we need to move towards what Santos (2015) calls an *ecology of knowledges,* making room for other ways of knowing, learning and sharing knowledge in HEIs. In doing so, we adhere to the idea of 'embracing a pluriverse' (Arora and Stirling, 2020), moving from bulldozer notions of modernity and ideas of saving the world to acknowledging the value of different forms of life and allowing many worlds to thrive.

The section first addresses the question of what we mean by diverse ways of knowing, the differences between pluralism and relativism or nihilism, and the ways in which this might be realized through coproduction. This section is followed by a discussion of the diverse justifications for multiple ways of knowing in HEIs, and the contributions they might make to achieving the SDGs. Key dimensions of access, language, curriculum, research, publishing and community engagement are then discussed. Finally, implications are drawn for action inside and outside the higher education system.

3.2 Framing ways of knowing

3.2.1 Going beyond 'mainstream knowledge'

In seeking to do justice to this topic, a serious challenge arises right at the outset concerning what knowledge and knowing are about in the first place. It makes an important practical difference, for instance, whether the underlying subject is approached as a noun (*knowledge*), or as a verb (*knowing*). In current 'mainstream' institutions of 'knowledge management', the tendency favours the former approach. Albeit recognized as taking different forms, knowledge is conceived as notionally static and measurable – as a 'resource', or 'asset', or form of 'capital'. Specific kinds of knowledge become visible in instrumental terms – as material 'tools', each supposedly applicable to particular problems (Sörlin and Vessuri, 2007).

In this way, temptations arise under a mainstream view to treat different 'kinds of knowledge' as clearly separable from each other, each in fixed association with neatly defined and distinguished contrasting aims, roles, contexts or implications. On this view, the key issue with different knowledges seems to be merely about how to 'integrate' or 'aggregate' or 'accumulate' them in supposedly additive ways. Imagined in this 'mainstream' material idiom, differences are conceived in relatively categorical and quantitative terms of bulk properties – like mass or volume. Any pluralities are circumscribed by the tasks in hand – and subordinated to the underlying additive commonality. This main 'stream' may move, then, but the flows are held metaphorically to be measurable, channelable and manageable (Grosfoguel, 2013).

But this mainstream imagination is not the only possibility. The focus may, for instance, be alternatively placed more on *knowing* (as a verb) than *knowledge* (as a noun). The connotations which then arise are inevitably far more dynamic and unruly: about processes, actions or practices, in which the main distinguishing features are ever-moving relationships, rather than fixed categories. This scenario has very different implications. Notionally hard material boundaries and differences slip away. Foregrounded instead are

contrasting styles, moods, and genres of knowing. In place of supposedly distinct instances, what emerges is an interweaving 'dance of knowing', in which each one in an irreducible complexity of moves connects intimately and profoundly to, embodies and entails a multiplicity of others, which inseparably motivate and coconstitute each other (Zanotti and Palomino-Schalscha, 2016).

3.2.2 From *different ways of knowing* to *knowing through difference*

When the circumscribed 'mainstream' noun-like categorical model of knowledge is expanded into this more processual and relational (verb-like) understanding of knowing, then many things follow. Set-piece divisions evaporate between 'quantitative', 'qualitative' or self-consciously 'hybrid' forms of knowledge. With all quantities clearly conditional on qualitative dimensions, ontologies and narratives, these jealously guarded divides are reduced to little more than presentational etiquettes (Wynne and Felt, 2007).

Likewise, ostensibly deep epistemic contrasts between 'interpretive', 'deliberative' or 'analytic' knowledge can all be seen as intimate interconnections, helping them to define and sustain each other. Rather than starkly dividing contrasting ways of knowing, each can in different moments or contexts and in its own way be variously 'inductive', 'deductive' or 'abductive'. Social context matters: as crucial as canonical methodological procedures are the disciplinary cultures within which these are set (Stirling, 2015).

What is true of mainstream knowledges in academia, policy and business, holds even more true where stratifications of privilege and hierarchies of power are still more pronounced – across wider marginalized or actively suppressed social ways of knowing: in 'local' settings (whether geographical, demographic or institutional); within underprivileged communities of workers, carers or migrants; around particular practices in agriculture, craft or home-making; on the part of groups who are routinely excluded on the basis of their race, gender, class, sexual orientation or caste; and throughout the multiplicities of Indigenous[19] cultures whose ways of knowing are most acutely 'othered' by Modernity (Alcoff, 2007).

That such disparate ways of knowing all thread intimately together, is shown (for instance) by there being no branch of physics or engineering so elite, tightly codified or precisely quantified, that it does not also depend on tacit folk practices. Likewise, relations between knowing and acting can also be seen to be far more interconnected. Rather than knowledge necessarily preceding practice, the history of experimentation shows that it is at least as often the other way around. The advent of particular practical instruments is often crucial to the transforming of what is known (Voss et al., 2006).

Nowhere are mainstream understandings more dissonant, then, than when they concern the nature of knowledge itself. Though counter-intuitive under such views, a more processual and relational understanding of knowing underscores that qualities of comprehension and associated effective action are not about asserting orderly, monolithic, hierarchical structures of 'knowledge integration'. What are needed instead are messy, plural, mutualistic cultures for the appreciation of difference. With ways of knowing recognized not to transcend society, but to be always embedded, situated and conditioned by their encompassing social contexts, the practical picture changes. Realizing the full potential of human understandings is less about *different ways of knowing* and more about *knowing through difference*. And recursively turning on itself in 'knowing knowledge', the solution lies not in adopting one perspective or the other, but celebrating a balancing dance between the two (Zanotti and Palomino-Schalscha, 2016).

3.2.3 Recognizing diversity does not mean 'anything goes'

One of the most widespread misunderstandings – and partisan misrepresentations – of what these understandings entail, is a doctrine that

19 In this report we refer to Indigenous communities and ways of knowing. In 1989, the International Labour Organization (ILO) adopted the Indigenous and Tribal Peoples Convention (No.169), which speaks to those who self-identify as belonging to an Indigenous people, and those who self-identify as belonging to a Tribal people. We are aware that the term Indigenous is ambiguous and has a tendency to mask distinctions and specificities. Our use of the term Indigenous is not meant to exclude Tribal or other peoples. For more information on ILO Convention 169, see https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::-NO::P12100_ILO_CODE:C169 (Accessed 20 October 2021).

'anything goes'. To interests and perspectives that are so minded, incumbent structures of power and privilege in existing global knowledge practices can be defended by caricatures in which the greater degrees of humility, pluralism and understanding of context described here somehow amount to a relinquishing of capacities to distinguish truth and error (Voss et al., 2006).

Ironically, it is actually a sign of the strength of these more nuanced relational understandings that they show such categorical positivist assertions to be so manifestly false. Being reflexive about contrasting contexts of knowing, in no way diminishes the capability to be *reflective* about how each delineates entire fields of truth and error. If truth is the 'elephant in the room' here, it looks radically different from contrasting angles. But the elephant is nonetheless emphatically there for all that (Voss et al., 2006).

Just because many aspects are equally 'true' in representing complex, uncertain, multidimensional realities, that does not mean that all possible pictures are equally valid, or that none can be recognized to be false. Given that this misunderstanding is so often expressed so categorically, it is ironic that it should itself represent such a clear category error. Just as appreciating a whole depends in everyday life on views from different angles, so robust social understandings rely on different ways of knowing (Voss et al., 2006).

An especially important repercussion of this truism – that diversity of knowing does not mean '*anything goes*' – is the current proliferation of authoritarian populism around the world, of cynical 'post-truth', 'anti-science', 'fake news' pressures. Intensified especially by the pandemic, one noisy reaction has, ironically, been emotive calls for the authority of mainstream scientific expertise to be asserted in even more prejudiced and overbearing ways (Wynne and Felt, 2007).

But it is a further strength of the reflexive, relational view of diverse ways of knowing outlined here, that this high-profile dogma can itself be so clearly shown not only to be false, but potentially counter-productive in disastrous ways. And this point is made by some of the founding mottos of mainstream science itself. Dating from the seventeenth century, these celebrate science as a process for organized scepticism and dissent, more than as a supposedly monolithic body of knowledge. The founding motto of the British Royal Society (for instance) is *nullius in verba* – 'take nobody's word for it'. Albeit rarely fully respected, it is aspirational qualities of equality, universalism, communitarianism, disinterest and transparency that distinguish science (albeit imperfectly) from other areas of culture (like politics, religion, government or business). Yet when this mainstream culture of knowledge production itself encounters scepticism, dissent (or attempts to engage on equal terms), it too often increasingly responds around the world, with ever more intense efforts to assert its own authority (Wilsdon and Doubleday, 2015).

Could it be that the globalizing spread of these intolerant preoccupations with 'academic excellence', 'science-based decisions' and 'evidence-based policy' may actually be provoking the very syndrome they seek to oppose? By denying and suppressing complexities, uncertainties, ambiguities and inequalities, perhaps these are part of the same authoritarian movement. Far from adding to the 'post-truth' malaise, perhaps greater plurality, humility and reflexivity in ways of knowing is key to finding the antidote for this growing pathology of the contemporary world (Wilsdon and Doubleday, 2015).

3.2.4 Coproducing knowledge

Among the many buzzwords arising from the more plural, relational and reflexive approach to knowing discussed above, few are more prominent in worldwide policy-making than the language of 'coproduction' (Jasanoff, 2004; Ostrom, 1996). But the fact that even this one term can be used in many – often incompatible, sometimes opposing – ways reflects the importance of diversity. Here, as with the politics of knowledge in a wider sense, what is needed is not insistence on integration, but greater appreciation for difference.

One major challenge highlighted by this language is that of recognizing that in order to be useful in addressing any given problem, knowledge needs to be 'coproduced' in particular ways and settings by a diversity of different communities and practices. In this sense, 'coproduced knowledge' is in itself a rather specific kind of understanding, which progressive interests may value especially highly (Ostrom, 1996).

Box 6. Danish Folkehøjskole

Inspiring and exemplifying a wider international movement, the Danish tradition of Folkehøjskoler – 'people's high schools' (Fayolle and Matlay, 2010), 'folk colleges' (Brunvand, 1996), 'folk academies' (Eichberg, 1997) or 'folk high schools' (Borzaga and Defourny, 2001) – was established in the mid-nineteenth century by followers of the Danish bishop, historian, educationist and politician Nikolaj Grundtvig (Hall et al., 2015). Originally intended to help improve the social circumstances and democratic standing of rural citizens (Borzaga and Defourny, 2001), around 75 Folkehøjskoler across this country of 6 million people have developed over two centuries into a diversity of institutions characterizable as 'forums for promoting community spirit, political awareness and social cohesion' (Green et al., 2006).

Mostly located in rural communities, these largely state-funded, lightly regulated and strongly self-organized residential colleges house between a few dozen and a few hundred students, often sharing communal activities and practical duties. The average age of a student is 23 years, but older people are welcome and a few Folkehøjskoler cater specifically for senior citizens over 55 years of age. With at least half of the syllabus on 'general, liberal, mind broadening' education, many Folkehøjskoler specialize in particular areas – including computing, sports, politics, ecology, literature, international studies, material crafts and performing arts. With no marking, grading or exams, courses run between two weeks (in summer) and 30 weeks, with annual registrations of around 50,000 amounting to nearly two per cent of the national adult population. Also significant are the wide social networks of motivated people who have in the past held teaching roles in these folk high schools (Collins, 2013).

In addition to progressive social and environmental education, Folkehøjskoler make important contributions towards sustainability by themselves directly advancing social inclusion, class and gender equality and democratic engagement. One key concrete contribution to global sustainability goals is the internationally important role played by Folkehøjskoler in the early development of wind power during the 1970s and 1980s. Outside Denmark, incumbent nuclear and fossil fuel interests were at that time conditioning governments to suppress similar early wind power experiments and brand them as 'failing' (Stirling, 2019). The unique position of Folkehøjskoler – working with social movements outside conventional education, research and innovation systems – helped nurture this nascent disruptive technology (Garud and Karnøe, 2003).

> We develop a perspective on technology entrepreneurship as involving agency that is distributed across different kinds of actors. Each actor becomes involved with a technology, and, in the process, generates inputs that result in the transformation of an emerging technological path. The steady accumulation of inputs to a technological path generates a momentum that enables and constrains the activities of distributed actors. In other words, agency is not only distributed, but it is embedded as well. We explicate this perspective through a comparative study of processes underlying the emergence of wind turbines in Denmark and in United States. Through our comparative study, we flesh out "bricolage" and "breakthrough" as contrasting approaches to the engagement of actors in shaping technological paths. (Garud and Karnøe, 2003, p. 277)

Early designs were commercialized first by small Danish firms, which later grew into multinationals (Ratinen and Lund, 2015). This is why current large-scale wind turbine technologies around the world depend disproportionately on design architectures, intellectual property and tacit knowledge originally pioneered in Denmark (Mortensen, 2018). Had it not been for this, it is arguable (subject to the perils of counterfactuals), that this massively important sustainable energy resource would not have been able to break the global unsustainable lock-in with anything like the same scale or rapidity (IRENA, 2012).

Another crucial insight in this vein is the acknowledgment that, inevitably, all knowledge (of whatever kind), is always inherently and unavoidably 'coproduced' alongside the social orders within which it is produced and shaped. In this sense, recognizing that knowledge is coproduced is about appreciating how context, culture and power can help shape the forms taken by all understandings. This is a general human condition, not a positive quality to be claimed by particular institutions (Jasanoff, 2004).

These meanings are in creative tension. If coproduction of the first (integrative) kind is held merely to mean inviting new people into a single specific process to contribute to one particular new kind of knowledge, then it can actually suppress the key message of the second (constructivist) kind of coproduction, which is that pluralities in knowledge are themselves both positive and irreducible (Stirling et al., 2018).

On this latter view, attempts to engineer a single integrated body of knowledge will always be contingent on particularities. Other ways of integrating will always be possible and hold different implications for practical conclusions and action. So, there are tensions between whether the benefits of 'coproduction' are seen to lie in striving towards single comprehensive bodies of knowledge, or a pluralist sensitivity and appreciation for a persistent diversity of understandings (Green, 2008).

So, the message is reinforced about plurality, humility and reflexivity. Where coproduction in the first sense encourages collaborations on equal terms across social differences, then it is entirely consistent with this. It is in this way that power and privilege can be progressively challenged – as much in ways of knowing as in wider political orders. But (as in science itself) a crucial condition is that power in all forms must be openly acknowledged and actively countered, not merely ignored.

Likewise, where the second (constructivist) sense of coproduction instils greater appreciation of the need for pluralism across an irreducible diversity of context-conditioned ways of knowing, then it is also entirely consistent. Here it is clear that progressive responsibilities in knowledge production are not just about *speaking truth to power*, but also about acknowledging how *power shapes truth*. Crucially, this is true in every context – not something even to aim (let alone claim) to avoid.

Each differing sense of coproduction brings to the fore essential values of equality and diversity in and between ways of knowing. Each challenges current pressures for hegemonic integration that can so damagingly reinforce existing patterns of exclusion and appropriation. If these forces are to be successfully resisted by Indigenous and other marginalized ways of knowing, then 'coproduction' (of either kind) needs to move away from claims-making and towards more convivial mutual challenge. By each questioning the other, qualities of plurality, humility and reflexivity are reinforced. Again, this highlights the centrality of *knowing through difference,* more than *different ways of knowing* (Kidd et al., 2017).

3.3 Why are diverse ways of knowing important?

3.3.1 Intrinsic, instrumental and justice-based rationales

Why is it important that we acknowledge different ways of knowing? We may be able to identify diverse epistemologies, but does that necessarily mean that we should provide space for them or utilize them? There are distinct ways in which we can justify the importance of diverse ways of knowing. First, they might be seen to have intrinsic value. So, the epistemology and ontology of a community may be seen as having its own worth, as being valid in itself, bringing richness to the lives of those within it. Furthermore, the existence of a

diversity of worldviews may enrich the lives of all (Fricker, 2007).

Second, diverse ways of knowing might have instrumental value. Alternative ways of viewing the world and stores of knowledge can lead to better outcomes in a material sense: for example, more effective forms of health care or better response to tsunamis can be achieved if we draw on Indigenous knowledge. An example of the instrumental combining of Western and non-Western knowledge systems can be found in pharmaceuticals. The very existence of bioprospecting by medical anthropologists as a major field of funded activity, shows in terms of manifest action (rather than words), that the ostensibly 'science-based' field of medical governance has actually been conditioned, by undoubted realities and hard-nosed economic interest, to acknowledge that entirely different epistemologies and ontologies are nonetheless capable of developing robust knowledge that science will, often enough, be in a position to validate.

Third, acknowledging and providing space for diverse ways of knowing might be seen as a question of justice. In the light of the historical processes of colonization, exploitation and marginalization, there may be a requirement for redress by acknowledging, respecting and providing space for the worldview of a particular community. For all peoples, regardless of particular histories, we can see it as a human right and a fundamental mark of respect for dignity, that their culture, language and knowledge systems can be expressed and are valued in all spheres of society (Araújo and Maeso, 2015).

Intrinsic, instrumental and justice-based rationales all have their place, though they may be emphasized to different degrees by different actors and organizations. Instrumental rationales are useful in bringing on board those who may initially be sceptical about the intrinsic or justice-based value. On the other hand, if these latter rationales are not acknowledged, a change of circumstances may mean that epistemic pluralism is abandoned in favour of more restricted views: for example, where a pharmaceutical company has exhausted the usefulness of an Indigenous community in identifying plants for its operation (MgBeoji, 2006). In practice, it is important that we maintain all three of these approaches.

3.3.2 Contributions to the SDGs

The 2030 Agenda is about sustainability. The SDGs that stem from it are both diverse and plural, and therein lies their strength. This diversity of goals, but also of metrics and targets, catalyses and articulates different kinds of knowledge, and these diverse perspectives are mobilized thanks to the emphasis the 2030 Agenda places on democratic processes (United Nations, 2015; Wölkner, 2016).

Sustainability, however, is an area in which traditional scientific production has not always had a favourable impact. Much of the knowledge produced by research and HEIs in general has had technological applications that have helped destroy our environment. This is where financing, particularly from private enterprises, but sometimes also from government, is more easily obtained. HEIs have produced many professionals, particularly in the areas of business and engineering, who are successful because they are taught to favour the design of products and the management of enterprises that generate greater profit for themselves and their employers, individual or corporate (Altbach et al., 2009). Inequality and poverty, two of the most salient problems that the SDGs wish to combat, are a consequence of this, as well as of the fact that professionals who reach decision-making positions in business or in government have not seemed able to design laws and policies that have effectively counteracted depredatory ways of producing and consuming. We are now in a position where our very existence is endangered. This alone should motivate important reflections on our performance and its effects.

In contrast, many traditional communities have been able to conserve the biodiversity of their territories, protect the forests, avoid erosion of the soil, control the production of harmful waste – many have practised a circular economy for centuries – and, in addition, put limits on accumulation and curtailed gross inequalities in their communities. This is a consequence of the way these traditional communities conceive the world. For many of them,

nature is considered sacred. Profit is not an objective in life, since accumulation is only valid when it is to be later distributed among the community. Self-sufficiency, on the contrary, is an objective, and that explains biodiversity: in Indigenous communities every product of nature is used, and when the soil is worked, a diversity of cultivated plants are grown that fulfil their nutritional and health needs (Calderon, 2014; Meyer, 2014). Many Indigenous communities have developed technology that allows them to cultivate their forests, protect their soil, live in climatically adequate housing, and transform the very diverse products of nature, both wild and cultivated. There is ancestral knowledge at stake, admittedly, but also wisdom that allows them to adapt to change and to develop new knowledge and technologies: a different way of knowing that leads to adaptation (UNESCO, 2009; Lowan-Trudeau, 2017; Rezaei and Dowlatabadi, 2016).

Box 7. Cauca Intercultural University, Colombia

The *Universidad Autónoma Indígena Intercultural del Cauca* (UAIIN, the Autonomous Indigenous Intercultural University of Cauca), in Colombia, represents a different type of HEI that breaks away from traditional universities. It was created in 2003 by the *Consejo Regional Indígena del Cauca* (CRIC, the Regional Indigenous Council of Cauca), constituted by traditional authorities of the Indigenous groups it represents. The Cauca region is home to 250,000 people belonging to nine different Indigenous groups. The purpose of the university is to strengthen and deepen the knowledge and values that the complex organizational, political and administrative processes in Indigenous territories demand.

The university is part of their education system ('our own education', as they call it) and is where pedagogical processes are defined, and where teachers selected by the communities themselves are trained to carry out the Intercultural Bilingual Education Programme. It is also the place where research projects that deal with culture, language, reconstruction of the historical memory and the strengthening of oral tradition are designed and carried out with the participation of the communities.

The strengthening of local processes is understood as a basic condition for dialogue with the global world that places Indigenous peoples in a position of dignity, equity and reciprocity. The University defines the knowledge and values that identify their cultures and orients education towards 'a life in dignity', which is how the Indigenous communities have defined their vision of the future. It conceives its educational activity as the continuation of the learning that occurs at the family level where Indigenous knowledge is socialized. The University then connects this local knowledge with the diverse worlds of universal knowledge, adopting an intercultural approach. Education at the Cauca Intercultural University projects native languages as valuable tools for building wisdom and knowledge that creates a solid identity committed to the generation of intercultural relationships.

> Only a formative process based on recognizing and valuing epistemologies that are present in each of the different cultures can contribute to transform diversity into something to be respected rather than discriminated against. (de Tattay, 2013, p. 93)

These communities survive because they have successfully resisted modern ways of living, producing and consuming. Many, however, have not been able to do so. It is the sustainability crisis that has made humanity look towards Indigenous and other ways of knowing. Still, the outlook of this 'discovery' is instrumental: to take from them what they have to offer that can be useful for the rest of humankind. It has rarely been truly dialogical, an approach which would imply meeting the peoples that have this knowledge with humility and openness and a willingness to achieve a deep

understanding and appreciation of the culture and the vision of the world that supports it, as well as with the disposition to share, in the same horizontal manner, the scientific way of knowing and specific knowledge on specific issues with the peoples of different cultures. This latter approach is one HEIs are in a particularly favourable position to adopt. The process and result of the dialogues may then feed into and consequently enrich their research, teaching and outreach/community engagement activities.

However, epistemic pluralism is not just a question of Western knowledge being placed in dialogue with non-Western knowledge. Even within the Western tradition, there are many forms of knowledge and knowing that have been marginalized historically, as emphasized by feminist scholars, among others. In all forms of professional work, tacit knowledge is crucial, derived not through formal education but through experience and interaction in the community of practice (Polanyi, 2009). Intuition and imagination, in addition to empirical observation and inductive and deductive reasoning, can also be seen as crucial to science and scholarship in all disciplinary areas within the Western tradition. Opening to diversity must occur therefore within as well as between cultures.

There are substantiated critiques of the imposition of a global agenda that is based on a fragmented view of the world (Chaturvedi et al., 2021). The SDGs can also benefit, in their future development, from dialogue with other ways of knowing. Nevertheless, a sustainable world, and what is needed to build and maintain it, must be considered the work of humanity as a whole. Epistemological dialogue around each of the SDGs, and about the whole idea of a sustainable world, is particularly worthwhile. Pluralities of *how* to know and diversity of *what* is known can contribute to build resilience in face of deep uncertainties such as the ones we are living with now. Thanks to diversity and plurality it is possible to solve or accommodate otherwise irreconcilable conflicts, to offer sensitivity across disparate contexts and to help mitigate epistemic lock-in.

3.4 Key dimensions of ways of knowing in higher education and potential implications

3.4.1 Widening participation

Higher education worldwide has seen extraordinary growth over the past half century. More than one third of the global cohort now go on to some form of tertiary education, up from only 10% in the 1970s and 20% in the year 2000 (UNESCO Institute for Statistics, 2021). Yet most of the new entrants into HEIs have been from the privileged echelons of society, and access is still highly restricted for certain social groups. Lower-income communities, those from rural areas, Indigenous and other minority ethnic and linguistic groups, and those with disabilities are under-represented all across the world. While women now constitute the majority of university students worldwide, in some contexts they are poorly represented, and across the world there are disparities in terms of disciplines (Salmi, 2020).

It is essential, therefore, that higher education systems put in place measures to ensure equitable access, and to address the barriers faced by social groups: in particular financial barriers – both directly through tuition fees and indirectly through other costs – and competitive exams which favour those with high quality basic education (Schmelkes, 2009). Allowing for a diverse student population, and one that is representative of the broader society, is the first step towards allowing for diverse forms of knowing. It is true that access is not a sufficient condition: in many cases throughout history new social groups have been permitted entry to educational spaces but obliged to integrate and adapt themselves to the majority culture, while leaving their own at the HEI gates. A diverse HEI in terms of students is not necessarily a diverse one in terms of knowledge traditions. Nevertheless, it is an

important piece of the puzzle, in conjunction with other measures outlined in the sections that follow.

Furthermore, the process of widening participation is needed for staff as well as students. While this is undeniably a challenge in contexts in which higher education expansion is in its early stages – with bottlenecks in the lack of Ph.D. courses – efforts must be made to ensure that the diverse communities in a society are represented among academic staff, professional staff and senior leadership.

3.4.2 Language

There are 6,500 languages in use in the world today (Hammarström, 2016), though many of them are disappearing. Language is the way that different types of knowledges are expressed. Language and culture are intimately related, and language names what is important to the culture. León-Portilla (1998) expressed it by saying that when a language is lost, we lose a window into the world. When we lose a language, things that matter to that culture stop being named, and when they do so they cease to exist (León-Portilla, 1998).

HEIs teach a very small fraction of the languages that are spoken in the world today. They also do very little in the way of representing national languages in the daily life of HEIs, as well as in documenting and preserving languages in order to be able to teach them and reproduce them. Language appreciation occurs with languages that are spoken nationwide or beyond borders, but hardly ever with the languages that are spoken locally, many of which are in danger of disappearing.

Language is a powerful tool for epistemological dialogue. HEIs can work towards the diversification of languages used within their walls, which is also a way of diversifying faculty and students. Awareness of languages and the knowledge that they contain is a powerful means of achieving intercultural education within institutions, and a means of projecting interculturality to a wider society. The role of HEIs in fostering language diversity, in strengthening local languages and thus preserving traditional wisdom and ways of knowing has great potential.

3.4.3 Decolonizing the curriculum

We have posited throughout this section that the advancement, and adoption, of more holistic, inclusive ways of knowing in higher education – empowering students with global knowledge and respecting different cultural approaches to problem-solving and human existence – are critical for the advancement of the SDGs, for 2030 and beyond. The global challenges being addressed by the SDGs are complex, interconnected, transdisciplinary, and immersed in societal governance and values. As such, the knowledge we bring to mitigate, or even solve, global challenges, must mirror that complexity and diversity, all the while respecting human rights in the development of more ethical, equitable and just education and research paradigms.

One movement advancing these ideas is that of decolonizing the curriculum. In short, decolonizing is about de-centring the existing, colonial form of knowledge production in higher education and ensuring that more diverse ways of knowing are respected and built into higher education curricula, practices and governance. Decolonization, allied to reconciliation efforts, is also about ensuring institutional reflection about how eras of colonialism, past and present, have shaped the modern higher education model and how that shaping has not been equitably beneficial to all, harming populations whose representation, perspective and voice has not been considered 'worthy', rigorous enough, or acceptable to higher education norms (Chinn, 2007).

Beginning in South Africa and spreading to other contexts such as the United Kingdom (UK), powerful movements such as *Rhodes Must Fall* have directly challenged the dominance of Western perspectives and voices in the university curriculum. In addition, longstanding anti-racism movements in higher education and other global institutions gained new visibility and voice after the tragic killing of George Floyd in the USA in May 2020, sparking new reflections by higher education leadership, investments in more diverse faculty and leadership, and workshops advancing anti-racist pedagogy and supporting reflection on critical race theory.

This work must continue if we are to bring different ways of knowing fully into our higher education systems, and be prepared to truly, ethically and inclusively develop knowledge to address complex global challenges. But how can we do this? How do we advance coproduction of knowledge in spaces where siloed, individualized scholarship – often conducted by isolating data from the complexities of society and nature – has been the norm and has advanced individual careers and institutional reputations for over 100 years? How do we rethink HEIs' approach to knowledge, incentives for tenure and promotion, include Indigenous and traditional knowledge,[20] and give a greater voice to community and youth, in a way that is inclusive, peaceful, and successful (Emeagwali and Dei, 2014)?

Box 8. The Indigenous Plan at the University of Victoria

One example of a HEI actively working to explore and implement decolonization is the University of Victoria in Canada. Committing itself fully to an Indigenous Plan – a strategic plan based on Indigenous knowledge principles – the University described the process they were undertaking for this work as 'confronting and challenging the colonizing practices that have influenced education in the past, and which are still present today' (Centre for Youth and Society, n.d., p. 1).

The plan, launched in 2017 as the University of Victoria Indigenous Plan: 2017-2022 (University of Victoria, 2017), recognized that the fundamental purpose of higher education is to provide students with the knowledge that will best support their achievements and success throughout their future lives. The plan also recognized that, if their delivery of that knowledge centred only upon one model of education – a Eurocentric or Western model – then they were not serving their students well, even misleading them and actively discouraging under-represented students who did not see themselves in their education. Instead, the University of Victoria noted that their intent was to provide students with 'diverse academic learning environments, curricula, and approaches to research within which Indigenous cultures, histories, and knowledge are embedded' (University of Victoria, 2017, p. 2). The University noted their work to decolonize was also about creating a more 'welcoming and validating environment' for the entire university community and building a racism-free, inclusive environment, representative of the diversity of cultures on campus.

The plan is, itself, holistic, inclusive, and adaptive. In addition to addressing the campus environment for student learning and faculty research, the plan reflects upon how faculty and staff might work together in new ways and new institutional structures, how governance systems of the University must become more inclusive and equitable, the importance of Indigenous language preservation, and how Indigenous ways of knowing are evolving, not static. Just as 'Western knowledge' is constantly being reviewed and updated with new ideas, Indigenous ways of knowing are similarly dynamic, evolving systems of understanding about how our societal norms and the natural world change and evolve over time. Finally, the University of Victoria Indigenous Plan made it clear that the document was to be considered a 'living document', a founding framework that is just a starting point for conversation and innovation. As with any strategic plan, the University recognized that the plan must receive continued attention, inspire consistent reflection, and serve as a space for ongoing dialogue within the community if the work, and the transformation to a more decolonized system, is to be successful.

20 The importance of incorporating traditional knowledge in higher education is also noted by the International Association of Universities (IAU) in their Iquitos Statement on Higher Education for Sustainable Development (International Association of Universities, 2014). This was an outcome of the IAU 2014 International Conference on Blending Higher Education and Traditional Knowledge for Sustainable Development in Iquitos, Peru.

One existing network through which higher education leaders may further explore global engagement and partnerships to develop inclusive curricula, research, structures and ways of knowing for the SDGs is the UNITWIN/UNESCO Chairs programme: 'promoting international cooperation and networking between universities… [to] reinforce higher education institutions worldwide, bridge the knowledge gap, mobilize university expertise and collaborate around the Sustainable Development Agenda 2030' (UNITWIN/UNESCO Chairs Programme, n.d.[21]). Launched in 1992, the network comprises more than 850 institutions in over 110 countries.[22]

3.4.4 Research

A core function of HEIs beyond educating the next generations is the 'creation of new knowledge' through a system of research and discovery by campus faculty, students and staff. While there is considerable regional variation, in English-speaking countries research is funded largely through competitive processes that use metrics defined by the funders (whether public or private), and in addition to direct costs the funding may also cover all or part of researchers' academic salaries. The outcomes of this funded research are, traditionally, expected to include one or more peer-reviewed academic papers, published in high-value ('prestigious') academic journals, and often written in a style to be read by peer academics rather than by the general public. Once published, academic research papers holding new knowledge are formally added to a list of the researchers' professional activities and, importantly, to their annual record for potential career promotion within higher education.

Higher education leaders will argue, fairly, that global investments in the current research ecosystem have been invaluable. The current system has been a cornerstone of the knowledge that fuels the global innovations and ideas that continue to save lives, underpin our security and infrastructure, and advance human prosperity. Yet they should all agree, too, that the current research ecosystem builds upon – and perpetuates – legacy issues of inequity, exclusion, power and privilege. Metrics of success and merit have been defined largely by those in positions of power in the research community itself, mostly in Western countries. As such, the current system, while advancing innovative ideas and solutions, remains structurally ill-equipped to fund global cooperation and the codesign of knowledge creation beyond traditional paths. More importantly for the SDGs, it is not yet structurally designed to truly value the different ways of knowing so essential to global sustainability, equity, and inclusion.

If we are to hope for research and innovation that advances towards a more sustainable, inclusive, and equitable planet, higher education leaders should also argue for more interventions that will promote a sustainable, inclusive, and equitable research ecosystem. As of now, we continue to approach global research challenges with misaligned, perhaps even harmful, tools. If we do not work to rethink and realign our global research ecosystem towards more knowledge coproduction and inclusion, we will leave brilliant ideas on the floor, exclude valuable partners, and perpetuate unethical inequalities in the research process as we develop a growing structural deficit in the knowledge needed to address the complex, transdisciplinary and global challenges described in the SDGs.

The good news is that, despite entrenched norms, a trend towards higher education support of more collaborative, transdisciplinary, globally relevant research is already afoot. Increasingly recognized as a requirement for institutional relevance and securing competitive funding for research – as well as a competitive advantage for those who show that their institutions' research helps solve global challenges – institutions have begun investing in more globally-connected, applied, and collaborative research programmes.

There are also investments in opportunities for researchers to develop skills and networks for more diverse dissemination of academic knowledge to communities, governments, and business leaders. And, with increasing pressures from funders and

21 This quote comes from a previous version of this website, accessed on 27 July 2021.

22 https://en.unesco.org/unitwin-unesco-chairs-programme (Accessed 29 August 2021.)

governments, HEIs have begun working to advance greater diversity, inclusion and equity in their hiring of researchers, and research leaders, from under-represented populations across disciplines.

This is important work. Yet it is fair to say that this restructuring of higher education research ecosystems is still very much in its infancy. Around the world, investments in change consistently come up against the inertia of powerful institutional norms, with any disruption to the status quo causing fear for institutional – and individual – financial well-being, promotion opportunities and research reputation. It is also fair to say that these changes, while critical, are still not enough. To truly address the future sustainability of our planet and people, we will need a research ecosystem which also recognizes the value of diverse ways of knowing and knowledge coproduction. We will need to advance and support more inclusive and equitable research design, operations, expectations, and resource investments – all at an accelerated pace – if we hope to truly address the global goals of the 2030 Agenda.

There are early, exciting roadmaps for this kind of holistic research ecosystem transformation, developing mainly in the participatory research, knowledge coproduction and 'boundary-spanning' academic communities[23] as well as in fields such as global health (Plamondon and Bisung, 2019), where issues of equity and inclusion are core aspects of practice.

The work to address many of these gaps, and to develop more inclusive and equitable knowledge coproduction frameworks, is advancing rapidly in the field of Arctic studies, especially as Arctic Indigenous Peoples develop and demand clear research engagement protocols on their own terms[24] requiring the respect of Indigenous rights, leadership and self-determination by outside academic research interests. These Indigenous research protocols also require researchers to receive invitations to work in study areas within Indigenous land claims, a formal commitment by researchers to the coproduction of knowledge and respect for Indigenous ways of knowing, the fair compensation of time for Indigenous knowledge holders involved in research programmes, the free, prior and informed consent of Indigenous leaders regarding research data management and dissemination, and a commitment to ongoing dialogue and relationship-building extending far beyond any single research programme. In recognition of the importance of moving to new research ecosystem protocols in the Arctic, global Arctic research networks and funders – including the USA National Science Foundation (NSF),[25] UArctic Network[26] and EU Polarnet, among others – are actively prioritizing research through diverse ways of knowing, knowledge coproduction and the active inclusion of Indigenous knowledge in structural research protocols, funding language, metrics for success, deliverables and operational investments (see Latola et al., 2020).

For higher education leaders working to advance more sustainable, inclusive, and impactful research to address global challenges and the SDGs, the time to explore revisiting and revising traditional research ecosystem structures, and advancing investments in research ecosystem transformation, is now.

23 For example, in partnership with the United Nations Environmental Programme (UNEP) and UNESCO, the International Platform on Biodiversity and Ecosystem Services (IPBES) continues to develop a stakeholder engagement framework for work with Indigenous and Local Knowledge (ILK) communities emphasizing respect, knowledge coproduction and reciprocity. IPBES also acknowledges that more work needs to be done for shared governance given unequal resource allocations and power dynamics, a lack of recognition that Indigenous knowledge is constantly evolving, and the fact that the intellectual property of Indigenous and local knowledge holders is often not adequately protected under conventional systems of law.

24 In 2018, the Inuit Tapiriit Kanatami (ITK), the national voice for protecting and advancing the rights of Inuit in Canada, published the National Inuit Strategy on Research (NISR) followed by the Inuit NISR Implementation Plan, noting the plans for research programme leadership led by Inuit Peoples of Canada and clear protocols for government and/or academic interests wishing to work with or for Inuit interests. For more information on the NISR or the Inuit Implementation Plan, see https://www.itk.ca/national-inuit-strategy-on-research/ (Accessed 30 August 2021) and https://www.itk.ca/national-inuit-strategy-on-research-implementation-plan/ (Accessed 30 August 2021) respectively.

25 NSF NNA Community Office is an example of a structure with both traditional research and Indigenous knowledge advisory boards, and clear guiding principles respecting Indigenous rights and ways of knowing. For more information see https://nna-co.org (Accessed 30 July 2021).

26 UArctic is a global network of over 200 institutions and organizations committed to inclusive and collaborative Arctic research and education governed and led by both Indigenous and non-Indigenous leadership. For more information see https://www.uarctic.org/about-uarctic/ (Accessed 30 July 2021).

Box 9. Navigating the New Arctic Community Office (NNA-CO)

In February 2021, the USA National Science Foundation funded an innovative partnership between Alaska Pacific University (APU), the University of Alaska Fairbanks (UAF), and the University of Colorado Boulder (CU Boulder) to host a new US$5 million Navigating the New Arctic Community Office (NNA-CO) (https://www.nsf.gov/awardsearch/showAward?AWD_ID=2040729).

The NNA-CO will include both research and Indigenous advisory boards, facilitated by Dr Nikoosh Carlo, a Koyukon Athabaskan who is an expert in science policy, and founder and CEO of CNC North Consulting. The two boards will offer expertise and advice to the office, advocate for more collaborative, equitable and action-oriented research, and facilitate dialogue on topics including coproduction of knowledge and reconciliation.

Decision-making and philosophical approaches of the NNA-CO will also follow seven Guiding Principles. These include effective communication for community building, a focus on convergence and collaboration, the acknowledgement of multiple ways of knowing and learning in Arctic research, a recognition of Arctic Indigenous Peoples' right to self-determination under the UN Declaration of the Rights of Indigenous Peoples (UNDRIP), a commitment to long-term institutional transformations that may be needed to address complex Arctic challenges, the recognition that Diversity, Inclusion, and Equity principles are foundational for programme success, and a commitment to human security and safety throughout the Arctic.

Finally, the NNA-CO will host four strategic objectives: the coproduction of knowledge with Indigenous peoples, convergence research, culturally responsive education and outreach, and open science (https://nna-co.org). The NNA-CO will also work to increase recognition of Indigenous knowledge, issues of data sovereignty, and the need for more collaborative and inclusive research design.

Matthew Druckenmiller, director of the NNA-CO and a scientist at CU Boulder's National Snow and Ice Data Center (NSIDC), noted:

> This office will bring people together to identify new ways to understand the holistic nature of Arctic systems, to learn from Arctic peoples who are adapting on the frontlines of change and to envision new and creative approaches to sharing knowledge across cultures and worldviews. (National Snow and Ice Data Center, 2021)

3.4.5 Publishing

One of the key functions of universities is to validate scientific knowledge in all disciplinary areas. It does this primarily through academic journals regulated by a system of peer review. While in many ways this is an intellectually sound and democratic process, in recent years it has led to some unfortunate outcomes in terms of representation of voices and ideas within the literature, and access of the general public to that literature.

While there is considerable diversity between disciplinary areas, and between different regions, many journals are run by commercial publishers with high charges for reader subscriptions. Access to scholarly publishing can therefore be difficult for those not affiliated to well-resourced universities in high-income countries. There are increasing numbers of open access journals, but many of these cover their costs through charges to authors, and thereby provide a barrier to those seeking to publish their research. Furthermore, there has been a growth in predatory publishers aiming to profit from academics' need to publish, but without a robust review, editing or distribution infrastructure.

Competition for publishing has been exacerbated by the perceived need for academics all around the world to publish in a limited number of prestigious

journals, reinforced by evaluation and promotion criteria. These journals are predominantly in the English language, especially those listed in exclusive databases such as Web of Science or Scopus, with the emphasis on those with a high impact factor. The very high rejection rates of many of these journals put them out of the reach of researchers in poorly resourced institutions, for non-native speakers of English and without robust support for academic writing. In addition to exacerbating inequalities, this emphasis on a restricted number of journals also leads to a homogenization of thought, and goes against the diversity of ways of knowing discussed in this report.

These dominant structures of sharing knowledge restrict access to those already involved, and are one of the root causes of power asymmetries. Specialized disciplinary outlets and pay walls impose barriers, and there is little diversification of ways of sharing knowledge. Open access (without fees either for authors or readers) and open science are therefore essential, diversifying the way we generate and disseminate knowledge, and diversifying our partners and our audiences (UNESCO, 2021). The metrics used to gauge research output should also be part of this discussion, either moving away from metrics or using them in creative ways to promote diversification and inclusivity rather than homogenization and hegemony.

3.4.6 Engagement with community and nature

HEIs, as has been noted throughout this section, are both the physical and philosophical gathering places where ideas, innovations, teaching, learning, research and service connect across generations, from students just finishing their secondary schooling to professors with decades of service. In a few disciplines – notably the arts and humanities, philosophy, geography, agricultural studies, environmental studies, Indigenous studies, and fields such as population biology, anthropology, and civil engineering – professors also highlight the concept of the coupled, or integrated, relationship of human and natural systems as a core part of the discipline's curriculum.

Yet, despite human lives being wholly dependent upon the natural world for our sustenance and existence, the idea that all of higher education should, or even must, centre its curriculum, pedagogy and research on deeper exploration and understanding of the connected – existential – relationship between humans and nature is not the norm. In fact, a more holistic approach is often seen in traditional academic systems as fact-free, radical, 'soft', less rigorous and less valuable for academic promotion. Much of the work of 'modern' academe is still considered most valuable – and most replicable for publication, tenure and promotion – when concepts relating to human communities and the natural world are isolated – removed from the complexities of society and nature to be studied as singular behaviours and controlled interactions in both time and space.

While isolated disciplinary knowledge is indeed valuable, creating depth of understanding and expertise that has proven beneficial to our understanding of human and natural phenomena, it is clear that production of knowledge that couples human and natural systems is critical for addressing global social, natural and policy-relevant issues such as the SDGs. Community-based participatory research in the natural and physical sciences is still in its infancy, with traditional academic systems – and academic journals – still struggling to understand how to support and evaluate studies that are intentionally complex, iterative, time-consuming, and holistic in their approach.

Sustainable development is about the future health of human communities within and among our natural systems on the Earth. As such, the connections, relationships, interlinkages, feedback loops and social context of any knowledge or way of knowing that are needed to address SDG targets must include more holistic, contextual, and grounded approaches – a perspective from which humans and natural systems may be studied together, over time, and iteratively.

While more and more leaders in higher education recognize a need to be 'problem solvers', 'globally engaged' and 'in service to society' as part of their brand, we have yet to see many HEIs going further and recognizing the immutable fact that human communities and nature are intermingled, that they shape one another, and that the future survival of both is incontrovertibly intertwined and inseparable. What if higher education leaders acknowledged this, and the required curriculum for a bachelor's degree required courses in holistic ways of knowing,

more inclusive approaches to human-community interactions, and a respect for cultures and knowledge systems with centuries, if not millennia, of experience of this approach?

For example, the holistic framework already underpins several Indigenous knowledge traditions. Sumak Kawsay (also known as *buen vivir* in Spanish, loosely translated as 'good living') is a philosophy of life of Andean origin that challenges the separated and exploitative relationship between human beings and nature, by placing the individual within a web of mutually supportive and harmonious relationships with the community and the natural environment (Brown and McCowan, 2018; Olivera Rodríguez, 2017; Villalba, 2013). These ideas have been influential in social movements and Indigenous communities throughout Latin America, including in the field of education. Ubuntu in Southern Africa also provides a generative resource to reframe human relationships. Translated simply as humanity, or 'I am because you are' (from the Nnguni Bantu languages), it affirms the reciprocity between human beings in their identities and interests, and has been widely utilized in the region and beyond to provide an overarching educational philosophy and basis of community life (Assié-Lumumba, 2017; Murove, 2014).

Looking to the Arctic, the work of Barnhardt and Kawagley (2005), summarized by Shirley Tagalik (2012) showed that: 'Indigenous worldviews are generally holistic in perspective and encompass interconnections amongst all aspects of life and place.' In fact, the words *Inuit Qaujimajatuqangit* (or IQ) mean 'a way of knowing' in Inuktitut (the Inuit language) and IQ has been formally defined by Inuit Elders and the Government of Nunavut as being grounded in four core principles, or *maligait*, of working for the common good, respecting all living things, maintaining harmony and balance, and continually planning and preparing for the future (Nunavut Department of Education, 2007).

IQ is further recognized as 'knowledge embedded in a process' with six guiding principles for the continuous application of IQ in Inuit society and nature. These are: (1) *Pijitsirniq* (or the concept of serving); (2) *Aajiiqatigiingniq* (or the concept of consensus decision-making); (3) *Pilimmaksarniq* (or the concept of skills and knowledge acquisition); (4) *Piliriqatigiingniq* (or the concept of collaborative relationships or working together for a common purpose); (5) *Avatimik Kamattiarniq* (or the concept of environmental stewardship); (6) *Qanuqtuurunnarniq* (or the concept of being resourceful to solve problems). These six processes are implemented throughout Inuit socialization (a process called *inunnguiniq*) and 'contribute to establishing the foundation for becoming an able human being' (Nunavut Department of Education, 2007; Tagalik, 2012).

3.5 Ways forward: Towards epistemic pluralism

The university is one of the world's oldest institutions, and owes its longevity in large part to its success in reinventing itself for different ages and continuing to provide a locus for transformation of learners and production of knowledge of value to humanity. This report fully recognizes the tremendous value of traditional HEIs and the contributions that mainstream science has made to societies. The argument put forward here is not that we should do away with the knowledge forms that have been at the heart of science and the university, but that we should set them in dialogue with other forms of knowledge. Pluralism and parity of respect are simply expressions of the same kind of rigorous scepticism about content that science itself aspires to.

Paradoxically, challenging the university in this way may be the best way to protect it. Given the profound changes in societies and increasing demands for a substantive democratization of opportunities and participation, and the complex global challenges threatening humanity's very existence, the traditional structures and procedures of HEIs are unlikely to be adequate. Opening up a more plural space within the university is key to the survival, not the destruction of the institution.

HEIs are the ideal setting for pluralizing views of the world and finding solutions to common problems by way of dialogue with different sectors of society and with different ways of knowing. Though HEIs have prioritized a certain worldview and idealized

science as the true way of knowing, it is in these same institutions that openness, acceptance of other 'truths', and recognition of the efficacy of other ways of knowing in understanding and solving problems that affect us all, are possible. Epistemological dialogue, involving different ways of knowing, other ways of proceeding towards knowledge and governance, and other 'truths', coming mainly from traditional sectors of society and local communities, is a new and largely unexplored way of knowing and learning (Andreotti et al., 2011). We know that dialogue transforms those involved in it. It is a form of learning and allows consensus to be reached. It opens up new avenues for problematizing and generating questions, thus seeking knowledge, in complementary ways.

One condition for dialogue is representation and participation. HEIs have to open up to sectors of society that have traditionally been excluded from their campuses. Efforts must be made to more equally represent all sectors of society in both faculty and students, in order for dialogue to be possible. Contributing to opening up lifelong learning opportunities to all, which is mentioned as a key part of SDG 4, is also an area that HEIs should strengthen and is a promising avenue for epistemological dialogue. Dialogue involves abandoning the idea of shaping others to reject their origin and accept 'modernity'. On the contrary, dialogue involves respect, openness and an un-prejudiced outlook on multiple potentially enriching encounters.

How then do we move forward in the task of ensuring diverse ways of knowing within HEIs? It is clear that simultaneous action is needed at multiple levels and in different spheres. While marketization and new forms of corporate management have compressed autonomy within contemporary universities/HEIs, there is still significant freedom of action for lecturers, and much of the innovation will take place at the micro-level. Students are also critical in this regard in forging new spaces for learning and engaging with communities. Yet action by HEI leaders is needed at the same time, in challenging the structures and governments of institutions.

We also need to think about working within and outside the HEI system. Portuguese sociologist Boaventura de Sousa Santos (2017; 2018) argues that in order to address the limitations of contemporary higher education and ensure an ecology of knowledges, we need to create what he calls the *pluriversity* and the *subversity*. The pluriversity is forged within our existing, traditional HEIs, opening up new spaces for alternative practices, actors and knowledge forms. It is the creation of the plural instead of the unitary in the higher education space. The subversity, on the other hand, is created at the margins of the higher education system. As such it has a much greater degree of freedom to experiment with new institutional structures, and is also subversive in the sense of challenging the academic and political hegemony.

Action to transform higher education in both of these ways is vital. Of course, it is difficult to transform systems overnight, but there is always room for movement towards the pluriversity. Despite the significant pressures on academic work in the contemporary era – brought about by intensified academic capitalism, marketization of access and competition for status through rankings and metrics – universities and HEIs in most countries still retain enough autonomy in teaching, research and community engagement for counterhegemonic initiatives. At the same time, there are contexts in which political and academic freedoms are currently severely constrained, and in which action will inevitably be more tentative.

The opportunities for creating subversities are much more limited, given the constraints of resources, regulation and accreditation. Nevertheless, as highlighted in this report, there are some inspiring examples of what can be achieved – see the cases of Swaraj University in India (Box 10), Cauca Intercultural University (Box 7) and Unitierra[27] in Oaxaca, Mexico. The Ecoversities Alliance[28] has been created to support these grass-roots initiatives. But more efforts are needed in this regard. Globally, higher education systems are vertically differentiated (or stratified) but show little authentic horizontal differentiation (McCowan 2019). Space needs to be opened up for new forms of institution to emerge: for example, Indigenous, environmental, ones that challenge our conception of the university in ways that will positively energize and refresh the higher education

27 https://unitierraoax.org/english/ (Accessed 30 July 2021.)

28 https://ecoversities.org/ (Accessed 30 July 2021.)

sector, and provide a vision of what is possible. In Latin America, intercultural universities have been set up in several countries. Most of these target Indigenous students and propose epistemic dialogue as well as research on language and local knowledge as a basis for educating future professionals trained in areas considered necessary for local development (Mato, 2008; Schmelkes, 2009; Lehmann, 2013; Dietz, 2009).

The task of making room for diverse ways of knowing is closely linked to the other main emphases of this report: the ways that HEIs engage with disciplinarity (Chapter 2) and external communities (Chapter 4). Thinking beyond academic disciplines is an important part of the epistemological and ontological shift that will allow different knowledge traditions, cultures and languages to coexist within HEIs. Equally, this shift will not be possible without the vibrant engagement of diverse communities and a porous boundary with society. Transforming an institution in this way is no easy task, but if we are to have any chance of achieving the SDGs and ensuring a fair and flourishing future for humanity, we must move from 'saving the world' to 'embracing a pluriverse'.

Box 10. Swaraj University

In a country dominated by the quest for educational credentials, Swaraj University is swimming against the tide. As part of its 'healing ourselves from the diploma disease' campaign, it states explicitly that no diplomas will be issued on completion of its courses, thereby challenging the idea that learning and real experience play second fiddle to qualifications.

Located near Udaipur in Rajasthan, Northern India, it was established in 2010 to provide an innovative form of higher education that was simultaneously accessible to learners, provided a richer and more meaningful experience, and could underpin the building of a more just and environmentally sustainable world. Manish Jain, one of the cofounders, stated:

> [S]mall communities, movements and local practitioners are reconceptualising learning in terms of a re-entanglement with land and place, with story and story-making practices, with gift culture as a touchstone for community living, with collective intelligences and subtle forms of consciousness, and with the messiness that comes from being in tune with oneself, with one's roots and with plural ways of knowing the world. (Jain and Akomolafe, 2016, p. 109)

In the spirit of transdisciplinarity, students, known as *khojis* (or seekers), can simultaneously explore several fields of study from organic agro-forestry, eco-architecture and renewable energy to alternative healing and film-making, all underpinned by a focus on self-designed learning and livelihood-regenerative entrepreneurship. Use of Hindi and local languages is encouraged, and experiences are designed to reconnect learners with their purpose and cultural environment as well as with the rest of nature. At the same time, there is an explicit challenge to the dominant culture of consumerism, waste and unlimited economic-technological growth.

The two-year programme consists of a combination of reflective group meetings, mentorship with an experienced practitioner (drawing on the Indian *guru-shishya* tradition), and experiential learning outside of the institution, in local communities and with civil society organizations, start-ups and social movements. 'Unlearning journeys' are also offered, such as the bicycle pilgrimage, in which the *khojis* travel without any money, technology, plans or first aid to more authentically engage with villages and traditional wisdom and innovation of India. These experiences are compiled in a unique portfolio which the graduates can then use in their professional lives.

The centrality of face-to-face community interactions and engagement with the local environment has meant that the initiative has been strongly impacted by COVID-19. Nevertheless, the commitment of founders and students, and the sustainable organizational model put in place, mean that it will continue to play an important role in building a real experience of a new way of life in India and beyond.

CHAPTER 4

Higher education partnerships

4.1 Higher education institutions for society

Higher education institutions (HEIs) originated as elite institutions for education and enlightenment, but early on they were also seen as instruments for welfare and development, and for using nature for human ends. Over the centuries, HEIs have grown in number and diversity. On the flipside, knowledge produced by research and HEIs has also led to technological applications, which have contributed to detrimental developments, environmental degradation being the most notable. In recent decades, some universities and HEIs became frontline institutions more broadly promoting and advocating societal changes for the betterment of society and nature, and in that sense were the forerunners of what, much later, was formalized as the Sustainable Development Goals (SDGs). However, there are still structural barriers that keep HEIs from more proactively addressing sustainability-related challenges.

The argument can be made that HEIs have not always contributed to the betterment of society (as outlined in previous chapters); however, we can also recognize instances demonstrating the capacity of HEIs to provide impactful science advice, and to some extent activism, that has promoted political or legal action and generated societal awareness. This chapter aims to focus on that capacity, which works by strengthening connections with society. HEIs have also been involved in collaborative research with the private sector to provide innovative solutions to environmental problems. Prime examples are the research on acidification and the destruction of the ozone layer. After the 1980s, the focus shifted towards markets and innovations, and now there is reason for cautious optimism that the pendulum is slowly swinging back towards issues of environmental sustainability. Thus, the argument can be made that historically, HEIs have interacted with society in numerous ways and that the sweeping accusation that universities resemble a detached and isolated 'ivory tower' is difficult to uphold.

What is needed is a nuanced picture of the partnerships HEIs are developing and nurturing. We will argue here that, given the dramatic, unprecedented challenges humankind is facing, these interactions need not only to be strengthened but also redirected towards the SDGs. This requires an acceptance among public and private financing institutions, but also widespread awareness and ownership within and among the HEIs themselves. The heterogeneity in the HEI sector implies that there are multiple ways by which support for the SDGs can be achieved. It also implies that we need different ways to rate the success and deliverables of these partnerships. In making this argument this chapter responds to the third of the core themes of this report: *How to strengthen the role of universities as partners with both private, public and civil society actors in the work with the SDGs*.

This section of the report will start out by talking about the SDGs and how they relate to HEI partnerships, and what the potential is. After that we will examine structural challenges and barriers, and the range of different forms or modalities of higher education partnerships. Finally, we will conclude this section of the report by pointing to some potential ways forward.

4.1.1 What the SDGs mean for higher education institution partnerships

The 17 interlocking goals that make up the United Nations 2030 Agenda – the SDGs – aspire to build a more equitable, peaceful, inclusive and healthy world. The goals are extraordinary in their reach, integrative in approach and ambitious in scope. The success of the SDGs, however, will demand a collaborative and transnational effort if they are to be effectively realized and sustained over the long term. In addition to directly participating in furthering SDG 4 – Quality Education – the three functions of the higher education sector (knowledge acquisition, knowledge creation and knowledge dissemination) can be harnessed to support all of the SDGs. Achieving the SDGs will intrinsically require knowledge-driven strategies and collaborative efforts. Currently, there are over 20,000 HEIs[29] spread over six continents, each uniquely positioned to play

29 https://www.whed.net/home.php (Accessed 29 July 2021.)

an important role in championing, advancing and contributing to the realization of the SDGs.

These are exciting times for higher education. Demand is on the increase as more and more people have access to and recognize the value of higher education. Partnerships between HEIs and the private sector, governmental agencies, non-profit organizations, tertiary and K-12 educational institutions, as well as communities, are now the norm, not the exception, with many of them contributing to the SDGs in one way or another. A growing number of partnerships are focused on the SDGs. For example, the longstanding research collaboration between German and Brazilian universities under the *Novas Parcerias Programme* specifically works to advance sustainable development. [30]The SDG Challenge led by The Netherlands' Soapbox platform in partnership with Impact Hub Amsterdam has spearheaded a collaborative initiative that involves participating Dutch Universities of Applied Sciences joining with a private sector entity to work with students from mixed backgrounds on a solution to '*sustainalize*' the business.[31] Other international programmes, such as the Fulbright Exchange Program[32] led by the USA Government in partnership with 160 countries, have the potential to be harnessed in direct support of the SDGs. Professional organizations and societies also play an important role in motivating, and in some instances requiring, faculty and academic leadership to incorporate the principles of the SDGs into the curriculum, and having professionals take continuing education credits in a variety of sustainability issues and topics.

Although HEIs have long enjoyed international faculty research collaborations and cross-institutional exchanges, the quickening pace of globalization is deepening and broadening cross-institutional collaborations and the sharing of ideas among faculty and students in exciting new ways. Globalization has created the conditions for a broad internationalization of higher education, and the potential to meaningfully create global competencies in its graduates. Even before the COVID-19 pandemic, distance learning was on the rise, diversifying who, how, and where people learn. New satellite campuses are being established around the world. More and more students are travelling from the global South to complete graduate education in the global North. [33]

Such ways of sharing resources and educating scientists from the South in the North can be an avenue for brain drain, and as such it is important to avoid centring such partnerships only on institutions in the North. Rather, such sharing of resources and partnerships should also be focused on capacity-building in institutions in the South.

HEIs in the global North, as well as those in emerging economies in South-East Asia, can more easily share their abundant resources with younger and/or more underserved institutions in the global South, and leverage these assets as part of an international effort in capacity-building.

30 https://www.daad.de/en/information-services-for-higher-education-institutions/further-information-on-daad-programmes/nopa/ (Accessed 10 January 2021.)

31 https://applied-science.sdg-challenge.com/ (Accessed 20 January 2021.)

32 https://eca.state.gov/fulbright (Accessed 10 January 2021.)

33 In this chapter we refer to the 'global South' and 'global North'. We use these geographical terms as shorthand to point to particular socio-economic inequalities and geopolitical power relations. The intention is not to rehearse overly simplistic dichotomies, and we are aware that these are broad-brush terms that gloss over the particularities of the various local contexts and situations subsumed within them. Whenever possible, we will give more specific information or examples to substantiate our arguments.

Box 11. Human Resources for Health Programme in Rwanda

A good example of capacity-building in lower and middle-income countries (LMICs) in bilateral partnership with higher-income countries (HICs) is the Human Resources for Health project in Rwanda, which for seven years has improved the quantity and quality of health professionals being educated. The President's Emergency Plan for AIDS Relief (PEPFAR) is a United States government initiative to address the global HIV/AIDS epidemic and help save the lives of those suffering from the disease. PEPFAR's contribution to the Human Resources for Health Programme in Rwanda was led and managed by the Government of Rwanda to increase the quantity and quality of health care professionals, build infrastructure and procure equipment to improve clinical service delivery. In partnership with United States health professional schools, a new training programme and curriculum was born through faculty twinning and introduction of new equipment in teaching facilities. Its focus was on hospital administration, nursing, midwifery and medical specialities.

The success of the programme became evident with the creation of eight residency programmes, with triple the number of doctors educated per year, and more than five times the number of advanced nurses during the life of the programme (Binagwaho et al., 2016).

Technological advances have allowed for greater transnational research and educational collaboration, with cross-institutional and transdisciplinary work, all of it recognized and endorsed by the United Nations 2030 Agenda and the SDGs. In addition, the cumulative problems associated with climate change, food and water security, dirty energy use, high rates of species extinction and poor land-use patterns are catching the attention of philanthropic organizations and other funding agencies dedicated to the support of research and educational initiatives that seek to provide concrete solutions to these challenges. Moving forward, this situation presents HEIs with multiple barriers, as has been discussed, but also with important opportunities to serve as both knowledge incubators and solution creators, while providing capacity-building around the SDGs. All in all, this situation can incentivize higher education to be more proactively involved in advancing the SDGs.

More recently, the public health crisis prompted by the spread of COVID-19 in 2020 and 2021, along with growing social unrest around the world, has increased the level of social, political, economic and environmental uncertainties that have impacted all manner of life across the globe, and together these jeopardize progress made on the SDGs. Higher education has not been immune to these challenges, as public resources, household incomes, and revenues from international students and auxiliaries in Europe and the USA, for example, have decreased. Classes have had to quickly pivot to online and hybrid learning modalities, and research has slowed and become more reliant on digital technologies.

In this rapidly evolving context, the future of research and education is set to dramatically change. Public research funding is expected to be less influential in setting research priorities and accessibility as funders are becoming more focused on the democratization of knowledge, leading to greater demand for higher education research outcomes to be shared on open platforms. Collaborative research agendas are becoming more common, and new technologies are transforming researcher workflows (National Academies of Sciences, Engineering, and Medicine, 2020). Expanding the number of free and open knowledge platforms has the potential to accelerate knowledge acquisition among populations previously unable to access higher education. The recent growth of open online educational resources and massive open online courses (MOOCs) provides tremendous opportunities for training, knowledge acquisition and sharing for, and among, under-resourced populations (Zhang et al., 2019). These growing infrastructures for mass quality distance education should also be developed in the South, with the same type of mentorship and training available for in-person education, to avoid the brain drain that

pulls people from their home countries to educate them in the North. Qualified teachers and experts could focus their efforts on strengthening local capacities in the South to set up the infrastructures and to educate students remotely.

The capacity to produce advanced research in a growing number of HEIs means that they are well equipped for making valuable contributions to the SDGs. The resources and activities in support of cutting-edge research offered by research-intensive institutions attract not only the best and brightest faculty, who are motivated to invest in relevant research and training, but they also function as an effective tool for recruiting excellent graduate students. HEIs foster, mentor, and graduate young talent who are well qualified and motivated to serve as SDG ambassadors, advocates, and implementers. At research-focused institutions the expectations for quality research output increases, as do the demands for securing external research funding that supports not only faculty but their graduate students as well. The exigencies of research-active institutions also carry notable social value, such as solutions-oriented approaches to scientific discovery that leverage trustworthy data, along with pioneering innovations, such as contributing to reversing climate change and developing regenerative environments (Live Science Staff, 2020).

Despite the many advantages that come from higher education incorporating and advancing the SDGs there remain a variety of institutional and contextual constraints that stand in the way.

4.1.2 Global education and skilled labour markets

The global economy and its evolution according to neoliberal economic principles has resulted in diminishing public investment in higher education, forcing HEI leadership to implement business models that have a bottom-line approach to the management of revenues, costs, and resources. This shift has also to some extent turned students into consumers, faculty into service providers, and both education and knowledge into commodities that can generate profits. In a climate of economic austerity, institutions compete to gain an edge in a highly valuable international student market. For example, in 2019, 23% of the Harvard student population were international students (College Factual, n.d.). In this context the education of international students is less a matter of North-South and South-North capacity-building than a means through which institutions expand their revenue base (Marginson, 2018). Diminishing public support for higher education has led to substantial tuition increases in a growing number of countries, and this model works against the kinds of partnerships needed to contribute towards the SDGs.

For example, the United States Federal Reserve reported the average single student loan debt in 2020 to be US$37,500, totalling US$1.6 trillion nationally (Federal Reserve Board's Division of Consumer and Community Affairs, 2019; Federal Reserve Bank of New York, 2020). Students in England graduated with an average debt of £40,280 in 2020 (Clark, 2020).

Box 12. University of Global Health Equity: Reimagined education and partnerships to address disparities in LMICs

Global education needs a new framework that emphasizes leadership skills focused on equity. This requires a new approach to education whereby people learn through a biosocial lens to better understand social determinants, and which creates a health workforce that is more knowledgeable in management and leadership, and better prepared to handle future threats. The University of Global Health Equity (UGHE) based in rural Rwanda has highlighted this. UGHE is a high-quality health sciences institution helping shift the centre of gravity in expertise and know-how from where it has traditionally been, within higher-income countries, to lower-income countries, and the continent of Africa specifically.

Leadership and management skills, often viewed by many health education programmes as an 'add-on', are embedded in all UGHE curricula as a means of developing a generation of bold professionals who push for large-scale positive change in health systems.

To ensure Equity in Education and to address disparities, UGHE provides high-quality, affordable or free education through full or partial scholarships. UGHE innovates funding methods such as the Umusanzu model (https://ughe.org/tuition-financial-aid/) to build and strengthen health systems in disadvantaged places. The Umusanzu agreement, for medical students to be educated free of charge, is made between UGHE, the students and the Ministry of Health of the students' country of origin and is part of what makes UGHE unique. Upon graduation, students commit to serve, under the direction of their Ministry of Health, for a period of six to nine years according to the difficulties of the placement, which can range from a city to a remote area or refugee camp. This is done to strengthen health systems and serve vulnerable communities, either in their own country or anywhere their government sees fit. Graduates work with their Ministry of Health to determine how long and where these placements will be.

Furthermore, Africa bears 27% of the global burden of disease but only has 1.7% of the world's physicians, emphasizing the critical global challenges of creating collaborative solutions through HEI partnerships to increase the healthcare workforce on the continent. For this reason, UGHE has developed partnerships with medical schools across Africa, Asia, Europe, and the USA (https://ughe.org/partnerships/) and is demonstrating their value in leveraging health education in low- and middle-income countries (LMICs). With these partnerships among LMICs and between high-income countries and LMICs, UGHE is implementing a series of faculty development programmes in Health Sciences Education, including Medical Education. These partnerships are instrumental in equipping the UGHE faculty with the knowledge and skills in innovative health sciences master's degrees, medical education and pedagogy, leading to the development of new UGHE-led Master's Degree and Ph.D. Programmes. These partnerships also demonstrate a model of capacity-building, with UGHE, an institution in a LMIC, developing full autonomy that enables it to leverage education for its students.

Needless to say, in countries without adequate student aid, the increasing cost of education diminishes access to quality education in HEIs for disadvantaged populations in higher-income countries, and the majority of the population in lower-income countries. This further accentuates the educational disparities that SDG 4 sets out to overcome: given the mutually reinforcing nature of all the goals, when there is a fall in equitable access to higher education, this impacts progress towards all the SDGs.

As HEIs in high-income countries compete to attract the best and brightest student minds from low- and middle-income countries, they also aggressively recruit research faculty from these countries. This, in addition to the global market in skilled labour generally, has resulted in an increasing number of highly skilled people from low- and middle-income countries moving to high-income countries. The educated class of the former migrates to the latter in pursuit of higher wages, better working conditions, better standards of living, access to more resources and stable political environments. In 2000, the estimated brain drain of the 48 least-developed countries (LDCs) was approximately 18.4%, a figure that was 10% more than for other developing countries and by far the largest in the world (UNCTAD, 2012).[34] This rolls back progress towards the SDGs because the cost of the brain drain is extreme, and paid by the South: On average, the health sector brain drain costs the continent of Africa

34 Although not the primary focus of the United Nations Conference on Trade And Development (UNCTAD) 2019 report on LDCs, brain drain continued to be identified as a challenge to sustainable development in LDCs (see UNCTAD, 2019).

around US$2.0 billion each year, and even more taking into consideration that one in ten doctors working in the United Kingdom is from Africa, saving the UK $2.7 billion in training costs (Mo Ibrahim Foundation, 2018).

4.1.3 Educational resources

More HEIs are forced to seek out funding and sponsorship from private, non-profit, and philanthropic organizations to balance their budgets and support research. The result is that funding structures for generating and sharing new knowledge are becoming increasingly competitive to secure. HEI partnerships with the private, governmental, or non-profit sector do not necessarily compromise the quality of research and teaching. Indeed, they can be leveraged to create new opportunities for hands-on learning, creating smooth degree-to-employment pathways, and an infusion of much-needed resources into higher education. Partnerships formulated under weak HEI leadership are vulnerable to failure when prepared without clearly outlined specific parameters, roles and responsibilities for each entity in the partnership. Other factors required to ensure HEI partnerships are strategically utilized to the maximum benefit of all involved – individual faculty, students, the HEI and the HEI partner – include a mutual understanding of the economic disadvantages of many global institutions in low- and middle-income countries, buy-in from researchers involved in the project, and agreed-upon terms governing who benefits from what, and how and with whom new knowledge is used and shared.

4.2 The range of HEI partnerships

4.2.1 Societal impacts – and feedback

Despite the different pressures on HEIs described above, with more emphasis on short-term economic returns, pressures on public financing, faculty specialization and reward systems focused on projects and careers linked primarily to publications and citations, there remains a general consensus that the higher education sector should be kept as independent as possible, with a mandate for research, education, and community engagement all geared towards the public good. HEIs should serve society through both intellectual and – where appropriate – potentially commercial innovations, but also operate, ideally, as market-free institutions that help society to navigate towards the currently overarching challenge: a sustainable future for humankind and the entire biosphere.

Our point of departure aligns with the 2019 Global Sustainable Development Report's expression of the lack of impact and progress across the dimensions characterizing the 2030 Agenda. In particular, four dimensions are identified where there is failure to move in the right direction: 'rising inequalities, climate change, biodiversity loss and increasing amounts of waste from human activity that are overwhelming capacities to process them' (Independent Group of Scientists appointed by the Secretary-General, 2019, p. xx). Health challenges are partly embedded in these issues, but the current COVID-19 pandemic also demonstrates the global vulnerability in this context. For instance, the pandemic further increased environmental threats that we as humans have caused to the biosphere through the pollution of the ocean with personal protective equipment (PPE) waste such as single use masks, gloves, and other items. The accumulation of this waste over time causes an increased negative environmental footprint due to increased CO2 emission (Liebsch, 2020).

However, HEIs should interact across the full range of political, economic, legal and other societal sectors to promote sustainability including advocacy, policy design, social experimentation, application of innovations and technology transfer.[35]

35 An interesting example of a higher education initiative embracing collaboration across sectors is the London Higher Civic Map, an interactive map showing more than 150 cases of higher education sector partnerships in London. The living document classifies cases by different types of civic engagement, including business, communities, creative, education, health, and sustainability. For more information, see https://www.londonhigher.ac.uk/civic-map/ (Accessed 14 December 2021).

HEIs will impart knowledge and values to a major proportion of future leaders and the population in general. This is undoubtedly the most important, long-term opportunity for the sector to transform society towards the SDGs. Their role as 'free' institutions promoting system change has never been more important, while instead there has been a strong bias and evolution towards 'publish or perish' regimes where outreach, interdisciplinarity and science advice are often downplayed because they are less rewarding in scientific careers. *This requires HEIs themselves to become aware of this bias and take their responsibility*. While not necessarily demanding a full transformation of the HEI sector, it will require substantial redirection of aims and goals, and commitment from the HEIs themselves is needed. A good example is the new Act on Higher Education in Norway, which explicitly includes as one of its four aims that universities should contribute to sustainability (University and University Colleges Act, 2021). Alternatively, HEIs could make a signed commitment to the SDGs (SDSN Australia/ Pacific, 2017).

This internal exercise in awareness, aim and mandate should then be followed by a wider engagement with society to promote the SDGs. These societal interactions should operate in both directions, by HEIs also incorporating feedback across the full range of functions, from *different ways of knowing* (see Chapter 3) to technological innovations. However our main focus should still primarily be the flow from the HEI sector to society at large in terms of values, rationality and a science-based approach to the SDGs. It is important to stress that it is not a case of 'one size fits all'. Different HEIs have different structures and national challenges, but the overall aim of interactions with society and making alliances should be shared and universal.

This should not imply the migration of HEIs away from basic research and 'classical' education, but rather orienting the applied side of the higher education sector away from purely economic return and towards the SDGs (of course not excluding sustainable business). This would imply cutting activities that run counter to the SDGs while stimulating activities that promote the SDGs.

4.2.2 Lifelong learning[36]

As societies become more and more dependent on academic knowledge, and the turnover of this knowledge increases, *lifelong learning* will become a new norm, and HEIs must thus offer courses (and values) in which the SDGs are embedded to leaders from politics, business, industry, teaching and other branches. HEIs must actively seek cooperation with key companies and stakeholders to develop courses and research specifically devoted to or relevant for the SDGs. Lifelong learning opportunities expand access for marginalized groups, including women. While such contacts exist, they are often primarily aimed at economic returns, and there is a need for a much stronger SDG emphasis.[37] During the pandemic, continuing education and lifelong learning has been on the rise as online education has become more widespread. For example, the European Consortium of Innovative Universities (ECIU) is an international consortium of research universities that codevelop knowledge and resources to have a societal impact and drive know-how for the continent. A concrete example is the Dublin City University (DCU), which is supported by the ECIU. DCU has partnered to launch a free course on higher education for lifelong learners, reimagining the traditions of higher education by offering learners the opportunity to excel in their higher education careers through this online development course. The ECIU also partners with businesses to solve real-life challenges and include key stakeholders in decision-making processes.

4.2.3 Interactions with politics and the public sector

HEIs should more actively engage in 'science-based' political influence in the form of science advice and science diplomacy (Scarfuto, 2019).[38] This should take place both at the national and local level, and in coalitions at the international level, but could also take the form of direct, bottom-up incentives following the example of the Climate Declaration to G20 (International Universities Climate Alliance, 2020), as well as the European Commission's

36 For more information see the web page for the UNESCO Institute for Lifelong Learning: http://uil.unesco.org/ (Accessed 27 September 2021).

37 https://www.mn.uio.no/ifi/english/research/networks/hisp/ (Accessed 22 July 2021.)

38 https://www.ingsa.org/ (Accessed 22 July 2021.)

global initiative for biodiversity protection.[39] It is also important to follow up on such statements and declarations at the political level. Another such example of HEI leadership is the very recent initiative whereby 56 universities in 30 nations have signed an agreement that commits them to work to achieve the SDGs by 2030 (ZJU Newsroom Global Communications, 2021). Among the five key goals of this initiative, one specifically addresses the need to work with global partners to promote innovative solutions.

While such declarations do not imply any legal commitment, there is no doubt that they raise awareness, and also commit HEIs to collaborate with other sectors. It is however important that each HEI has publicly available checkpoints to monitor its actual performance in this regard. Furthermore, public debates, public arrangements and non-governmental organization (NGO) alliances should be more actively motivated to bridge the gap between HEIs and civil society.

Box 13. University engagement through the joint Climate Declaration appeal to the G20

An example of broad HEI initiatives to stakeholders and the 'outside world' is the Universities' joint Climate Declaration appeal to the G20. The International Universities Climate Alliance member universities span all inhabited continents, representing one third of the 100 highest performing climate research universities and a quarter of the top 100 environmental research universities worldwide (https://www.universitiesforclimate.org/).

The Climate Alliance is unprecedented in scale and scope and will support world leaders, policy-makers and industry in planning for, and responding to, climate change. The advent of the Climate Alliance comes at a time when momentum is building for countries to decarbonize their economies. In recent months there have been moves by various nations to fortify incremental efforts with policies and actions equal to the urgency of the situation. The Alliance will provide a central hub for universities to share the latest climate research and enable greater collaboration between leading research teams.

> Dear G20 Leaders,
>
> The COVID-19 pandemic has reminded the global community how closely we are interlinked, and that without global cooperation people suffer unnecessarily. When faced with the challenge to protect humankind from climate change, the best way forward is informed by the most up to date scientific knowledge developed and delivered through multinational collaboration and concerted efforts.
>
> We implore world leaders – particularly G20 leaders – to learn lessons from managing the pandemic: namely, to heed expert advice, to act with urgency, and to prioritize investments strategically. In the case of climate change, this means decarbonizing the economy to build a climate-resilient world for future generations. Without a focus on a carbon-neutral economy, investments are incompatible with the important commitments that nations have pledged in the Paris Agreement. (International Universities Climate Alliance, 2020)

39 https://ec.europa.eu/environment/nature/biodiversity/coalition/index_en.htm (Accessed 22 July 2021.)

4.2.4 Interactions with the private and business sector

There is a long tradition of strong links between certain disciplines within HEIs (economics, law, technology, etc.) and the private sector. Generally, this has been motivated by economic interests on both sides, and financing institutions have promoted and strengthened these economic incentives in recent years. For example, the EU Horizon 2020 programme has explicitly prioritized projects promoting technological innovations and economic returns. To the extent that such interactions promote new technology in support of the SDGs, it is clearly a fruitful strategy. HEIs should however more broadly promote research and initiatives financing incentives to combat loss of nature, climate change and inequalities, for example, the EU Green Deal.

The private business sector is facing new expectations, regulations and demands to meet both market expectations and regulations, and there is a growing demand for competence in this area. As an example, the Norwegian Employers Organization (NHO) recently expressed concern that 60% of companies were lacking this competence, which is clearly a competitive drawback as it will slow the fulfilment of the SDGs. The Employers Organization underlined the responsibility of the university sector to provide this kind of education, which again demands a new take on both regular education and lifelong learning. Some HEIs have already taken action on this, for example, Cambridge University through the Cambridge Institute for Sustainable Leadership, which is a highly influential agency encouraging business and financial markets to act in sustainable ways, also based on economic incentives.[40]

4.2.5 Interactions with civil society

Democratizing research, whereby local actors work together with university researchers in the cocreation of knowledge, not only empowers communities to influence how research impacts them; it also serves as a mechanism for accelerating the realization of the SDGs.[41] The growing field of community science, otherwise termed 'citizen science', refers to a participatory research practice whereby non-university researchers participate in the production of scientific knowledge.[42] In this model, the partnerships can involve 'government agencies, industry, academia, community groups, and local institutions' working together to 'monitor, track and respond to issues of common community concern' (Whitelaw et al., 2003, p. 410). The community-based research model offered by community science allows university researchers to fill important data gaps in a timely and more comprehensive manner, as local groups assist with data collection, monitoring, and management.[43]

40 https://www.cisl.cam.ac.uk/business-action/sustainable-finance/investment-leaders-group/risk-and-resilience (Accessed 30 August 2021.)

41 There is an ongoing debate both in academia and in policy circles about the potentials and challenges of engaging citizens in science and democratic decision-making or deliberative democracy more broadly. For the academic debate see for example Wynne, 1992; Irwin, 2006; Brown, 2009. For discussion at a policy level see the recent report by the OECD (2020) or the widely cited report *Taking European knowledge society seriously* (Wynne and Felt, 2007).

42 We prefer the term 'community science' as used by Carr (2004), as distinct from the more popular term 'citizen science' for the simple reason that not all members of a given community share the same legal status of a citizen (Charles et al., 2020).

43 The term 'data' here not only refers the use of the term in the natural sciences, but is intended to be more extensive, including information used in advancing humanities, social sciences, arts, and legal research.

Box 14. Community science at the Institute for Policy Research and Engagement

The Institute for Policy Research and Engagement (IPRE) at the University of Oregon in the USA uses a reflexive research model of community science. Faculty and students from the University of Oregon partner with Oregonian government and NGOs, as well as local community groups, to identify and conduct research projects (https://ipre.uoregon.edu/). IPRE research partnerships are best described as 'reflexive', in so far as research projects begin with a shared notion of research as a public good, one that serves a social function. As such, a collective understanding of what constitutes a socially and environmentally relevant research project is used in selecting what will be researched, with whom, and how. IPRE projects are driven by a messy process of social engagement that acknowledges the variegated interests and needs of different publics, going on to use an iterative research methodology that incorporates different forms of knowledge and understanding to expand how research takes place and is in turn applied. The boundary between the university and the many publics with which research engages and collaborates is hereby blurred, opening up spaces for more nuanced understandings of scientific impact that are less unidirectional in format and more transdirectionally constituted (see Felt et al., 2013).

In Norway, GEco uses a citizen science app it developed to map alpine tree and forest lines using data collected by hikers (Naturhistorisk museum, 2018). In Kenya researchers are using data on water levels in the Sondu-Miriu Basin collected by community members who submit information using their cell phones (Weeser et al., 2021). As a method, community science connects the 'application of the scientific method with processes of social learning' (Charles et al., 2020, p.78). In this way HEI resources (knowledge, skills, technology, funding, and space) can be harnessed to train and build the capacity of local actors to participate in data collection and management, improving both research outcomes and their implementation. Diversifying knowledge inputs by integrating public knowledge with that of knowledge generated in institutions of higher learning offers important lessons on research impact, along with the added benefits that come from expanding the definition and practice of institutionalized forms of knowing. Community science radically transforms the power relations that structure the production of knowledge, with users being transformed into knowledge producers. This is not to suggest that community science is not without its challenges. One is the question of who ultimately owns the intellectual property rights of research outcomes – who owns the research outcomes and how is it decided who uses the research, and for what ends?[44]

4.2.6 Special Spotlight: International partnerships

In the aftermath of the colonial era, HEIs in the former metropolis forged linkages to help build and strengthen the capacity of emerging HEIs in low-income countries. In that context, bilateral and multilateral aid agencies have, since the 1960s, financed scholarships and partnerships to train the academic force of young HEIs in Africa, Asia and Latin America and engage in joint research activities. This section analyses the strengths and limitations of these traditional 'North-South' partnerships and explores the growth of new flows of knowledge-sharing and capacity-building relationships among emerging economies and lower-income nations.

44 Other concerns around community science include questions of implicit bias, quality control, and the standardizing of sampling. For more on the challenges associated with community science, see Weber et al., 2019.

Box 15. Community engagement: Village Life Outreach Project

Village Life Outreach Project (VLOP) is a transnational community research and action initiative that involves a non-profit organization located in Cincinnati, USA working together with faculty and students from the University of Cincinnati, local members of the Cincinnati community including high school students, community members of three villages in rural United Republic of Tanzania (Roche, Nyambogo and Burere), and the Shirati Health, Education and Development Foundation (SHED, a non-profit organization in Shirati, United Republic of Tanzania) (https://villagelifeoutreachproject.org/). Members of the three partnering Tanzanian villages formed representative committees focusing on water, education, and health. They work collaboratively with VLOP and SHED to shape research goals, methods, and outcomes. One outcome of the partnership is a new health facility.

The research process and its application in the form of a health centre is the result of researchers from the University of Cincinnati learning from, and using local knowledge of building materials, environmental factors, and community skillsets. In this way, public knowledge directly informed and shaped how university researchers applied their knowledge of sustainable design and engineering practices in the development and construction of a health clinic – Roche Health Clinic. The end result was a zero-energy building constructed using a system of interlocking bricks made from local materials and labour (Zaretsky, 2011). The added benefit of involving local actors in the research process and the realization of research outcomes is a greater amount of buy-in for the ongoing maintenance and use of the building, expanded economic opportunities for the local communities who have now integrated the ISSB building system into their building practices, as well as more durable and safe buildings that are less prone to structural complications.

Though bilateral and multilateral donors have generally given priority to basic education as part of the global Education for All commitment (Fast Track Initiative and Global Education Partnership), donor support for investment in higher education has continued to benefit many lower-income countries. The financial and technical assistance programmes funded by donors have supported partnerships aiming at building capacity in HEIs in lower and middle-income countries through mobility exchanges, graduate training, collaborative research, and, more recently, action-oriented projects to help local communities on some dimensions of the SDGs.

If procuring adequate research and teaching resources has become a mounting challenge for higher education in the global North, it can be crippling for HEIs in the global South, further accentuating the asymmetrical power relations shaping the global market in higher education. For example, in 2014 the gross enrolment ratio in tertiary education in North America was 84.0%, in Europe and Central Asia 62.1%, and in Latin America 47%, but only 20.8% for South Asia and a mere 8.9% in sub-Saharan Africa (Roser and Ortiz-Ospina, 2019). Institutions in the global South need greater investment to boost the capacity of local researchers, research institutes and think tanks to avoid a South-to-North brain drain, and allow lower-income countries to find sustainable solutions that match their needs. In this regard, greater representation and engagement with researchers and students from the institutions in the global South at global academic conferences would ensure research and teaching meets and integrates the needs of those living in the global South, as well as strengthening North-South and South-South higher education systems and teaching collaborations.

Challenges facing North-South partnerships[45]

North-South partnerships face three significant challenges that can undermine the effectiveness of collaborative programmes (Salmi, 2017). The

45 This section and the following one are mainly based on an analysis of North-South partnerships in certain regions of the world, mainly Africa. They do not pertain to Latin America, where financing from the North is not as important and where partnerships with the North are more academic and horizontal.

first one is the possible divergence of purpose depending on who is driving the partnership agenda. When the objectives and operational rules are defined primarily by donor agencies in the North, there is a risk of shaping the partnerships to accommodate the internationalization goals of HEIs in the North without taking into account the capacity-building needs of HEIs in the South. In this regard it is crucial to move beyond 'knowledge transfer' models of unidirectional transfer from North-to-South – which in many cases involves more financial gains for the partners in the North than those in the South – to a model that acknowledges the diverse socio-economic realities as well as widely different perceptions of risk and remedies related to many of the SDGs. Other impediments to successful North-South collaborations around the SDGS arise from differences across higher education systems (academic calendars, study credits, ethics review processes, faculty and student expertise), time zones, learning styles, language barriers, communication approaches and cultural norms. Equal partnership between HEIs in the North and the South cannot be created by imposing knowledge from the North.

It is also important to be aware that various SDGs are perceived differently in different regions of the world. Health and climate risks for example are perceived as more threatening in vulnerable (often southern) regions than in many northern countries,[46] and aspects related to economic growth and land use commonly look different in the South than the North.

The second challenge is at the level of the partner institutions in the South, which do not always have a clear development strategy. Even when they have a strategic plan, international partnerships are often established on an ad hoc basis at the initiative of individual academics or academic units, driven by personal contacts rather than institutional priorities. This can result in the proliferation of small partnerships that might all be useful in themselves, but are not necessarily well coordinated and aligned with the development objectives of the HEI or the achievement of the SDGs.

The last challenge is the limited duration of partnerships due to the short time horizons of donor funding. Many donor programmes obey government priorities, which often change when governments change, and set funding cycles of three to five years, which are generally not sufficiently extended to support the long-term capacity-building needs of partner HEIs in the South. Donor support is often embedded in projects whose duration does not exceed four or five years, reflecting regular budget cycles and common restrictions affecting the length of financial commitments to aid programmes and projects. It is therefore important to sequence donor-supported partnerships in accordance with the time requirements and the institutional capacity of the HEIs in lower-income countries.

Improving North-South Partnerships

Good practices to address the challenges outlined above include three main dimensions: shared decision-making; alignment of partnership goals with the self-defined visions and mission of HEIs in the South; and focus on capacity-building efforts.

In the first instance, joint decision-making for the design of collaborative projects between HEIs in the North and their counterparts in the South makes for a mutually beneficial agenda that is aligned with the development needs of HEIs in the South. HEIs in the North should recognize the expertise in the South, and the fact that their counterparts in the South are more aware of the relevant local issues and research priorities. While this is not the usual practice with many donor agencies, positive initiatives have been launched in recent years, such as the NORHED programme of the Norwegian Government that started in 2012 and is now in its second phase, from 2021 to 2026.[47] Not only are the project objectives defined as the result of a joint effort between universities in the North and a group of universities from several countries in the South, but in addition it is a university in the South that is responsible for leading project implementation for the consortium of universities in the North and the South. Involving several HEIs from countries in the South that face

46 See cf. YouGov 2019 study: https://yougov.co.uk/topics/science/articles-reports/2019/09/15/international-poll-most-expect-feel-impact-climate (Accessed 30 August 2021).

47 https://www.norad.no/en/norhed (Accessed 22 July 2021.)

similar conditions and challenges allows for fruitful and mutually beneficial collaborations.

The second approach to improve the effectiveness of North-South partnerships is to make sure that the planned collaborative projects are fully aligned (and codesigned) with the vision and mission of HEIs in the South, and well-integrated into their strategic plan. Outcomes tied to progress on SDGs should be incorporated in all the structured partnerships. For that purpose, the group responsible for project design should seek an adequate balance between a decentralized process within the participating HEIs, to ensure full ownership by the various academic teams involved, and joint coordination to integrate the project into the development agenda of the HEI as a whole and its selection of target SDGs.

Lastly, and perhaps most importantly, partnerships should give priority to the objective of sustainable capacity-building. This involves three elements. First, public HEIs in the South suffer from generic governance barriers (for example, frequent rotation of people in leadership positions) and management constraints (bureaucratic procurement procedures) that might negatively affect the implementation of project activities. These should be identified as part of the preparation process and agreements should be reached to remove or mitigate them.

Second, the funding horizon should be dictated by the capacity-building requirements of beneficiary HEIs in the South, not by the criteria and regulations of donor programmes. Improvements in research and teaching capacity do not happen instantly or even quickly. Institutional change and capacity development are long-term processes that require many years of sustained intervention. For example, to start a new programme at the master's level would require experienced professors from more advanced HEIs or from the diaspora to supervise the doctoral students who would then become young faculty members able to implement the new master's programmes. Similarly, building up the research capacity of a university department in a partner country would require setting up new labs and training a core group of researchers by implementing joint research projects.

Furthermore, the likelihood of smooth project implementation and increased longer-term sustainability is much bigger if the beneficiary HEIs can contribute at least part of the funding. For example, instead of just financing advanced equipment for scientific laboratories, the donors could enter into an agreement whereby they would fund maintenance and equipment renewal expenses using a sliding schedule, with the counterpart HEI in the South covering a progressively larger share of expenses over the duration of the project, thus guaranteeing the availability of national funds once external funding stops.

Thirdly, the impact of partnerships is greater if most of the project resources can be spent in the South rather than in the North. For example, rather than offering scholarships for doctoral studies in OECD countries without considering the risk of brain drain, support for graduate programmes in the strongest local or regional HEIs could go a long way towards building the research capacity of HEIs in lower-income countries. A relevant example in that perspective is the Africa Higher Education Centers of Excellence (ACE) Program, supported by the World Bank and a few European bilateral donors as a regional initiative to boost the research capacity of specialized regional institutions with the vocation of serving the whole of sub-Saharan Africa.[48]

New partnerships in a multilateral world

In the past two decades, new partnerships have emerged outside the classic North-South relations framework, creating new pathways and modalities for knowledge-sharing and capacity-building among HEIs. Two types of such initiatives are worth mentioning in this exploration of HEI partnerships for the SDGs: intervention of new donor governments; and development of regional and multilateral networks.

In recent years, the governments of countries as diverse as Brazil, China, India, Republic of Korea and Singapore have started to provide financial and technical assistance to low-income countries in South Asia and sub-Saharan Africa. One worthwhile example is the Partnership for Skills in Applied

48 https://www.worldbank.org/en/results/2020/10/14/building-centers-of-excellence-in-africa-to-address-regional-development-challenges (Accessed 31 July 2021.)

Sciences, Engineering and Technology (PASET), launched in 2013 at the initiative of several African ministers of higher education, which seeks to strengthen science and technology capabilities for the socio-economic development of sub-Saharan Africa.[49] PASET functions as a convening platform that brings together African governments, the private sector, established regional and multilateral partners such as the African Development Bank and the World Bank, and new development partners, including Brazil, China, India, and Republic of Korea. The Partnership finances scholarships for female Ph.D. students enrolled in African institutions and knowledge-sharing activities among African HEIs.

The emergence of regional and international networks has also accelerated knowledge-sharing and collaborative initiatives that support the capacity-building efforts of HEIs in low-income and fragile countries. Two examples can be mentioned in this respect. Twenty years ago, quality assurance was still a foreign notion in the South-East Asian higher education landscape. Today, thanks in great part to the successful efforts of the Asia-Pacific Quality Network (APQN), most countries in the region have well-developed quality assurance systems that support quality enhancement for HEIs. APQN has provided a non-threatening platform that allows quality assurance agencies and HEIs in the countries with less capacity, for example Cambodia, Laos, Mongolia and Myanmar, to benefit from technical assistance and twinning arrangements with agencies and universities in the more advanced higher education systems (Salmi, 2015).

The Association of Pacific Rim Universities (APRU) brings together 55 HEIs from South and North America, East Asia and the Pacific. It contributes to progress towards the SDGs by raising awareness and encouraging the involvement of future leaders in the Pacific Rim region, supporting capacity-building by developing a network of experts across disciplines, and building an effective platform to connect the latest research and experts with policy-makers to facilitate policy development and implementation. In a recent article advocating for a new form of multilateralism to prevent HEIs from becoming irrelevant, the APRU General Secretary provided an excellent summary of the responsibility of HEIs in the new era after the COVID-19 pandemic.

> To address the public interest, we need to emphasize higher education as a public good which aids social mobility and inclusion, seeks to align teaching and research with global challenges and honours public service and social commitment. (Tremewan, 2020)

The use of these kinds of HEI partnerships and networks and creative new partnerships for the SDGs can be an impactful method of paving the way towards the 2030 Agenda.

4.3 Ways forward

Examples of ways forward and processes to adopt or take motivation from are provided in the text and boxes above. Recommendations for how HEIs can interact with society at large deal with both internal and external strategies. HEIs can instigate bolder and more inclusive institutional policies that support transdisciplinary research, scholarship, and creative practices across the professional lifetime of faculty. In particular, the discipline-specific focus of reappointment, promotion and tenure guidelines and evaluation predominantly rewards faculty who contribute to highly specialized forms of knowledge production. Instead of penalizing faculty who become active in community engagement and transdisciplinary research and teaching, performance assessment criteria could be revised to reward a more diverse range of contributions. This could be promoted by example by instituting a

49 https://www.worldbank.org/en/programs/paset#:~:text=PASET%20is%20a%20unique%20Africa,and%20leadership%20with%20global%20knowledge.&text=PASET%20supports%20both%20regional%20and,technical%20assistance%20and%20knowledge%20exchange (Accessed 31 July 2021.)

series of transdisciplinary 12-month SDG Fellowships to facilitate and support faculty research and outreach. The SDG Fellowships would be offered to faculty on an annual basis. Additionally, the creation of a Global SDG Research and Teaching Central Fund could be relevant, which would support the following elements: (1) Annual individual faculty grants (including graduate and undergraduate research advancement in order to develop capacity); (2) Annual grants for transdisciplinary, cross-institutional faculty research teams; (3) Grants for exhibitions that promote the public sharing of SDG knowledge; (4) Grants to advance training on SDG-related themes.

We also strongly recommend a **Global SDG Higher Education Institution Benchmarking system**. Unlike a ranking system that creates a competitive environment working from the top down, the Global SDG Higher Education Institution Benchmarking system would qualitatively and quantitatively compare how HEIs advance different SDGs across the three areas of research, teaching, and outreach/community engagement, with highest recognition given to those that holistically address a large number of SDGs across all their activities. HEIs would pay a fee (the amount would be differentiated according to wealth and institutional capacity) to belong to the Global SDG Higher Education Institution Benchmarking system, and the fees would contribute to the Global SDG Research and Teaching Central Fund. The new rating system could be modelled on the U-Multirank methodology, or be developed in partnership with U-Multirank (U-Multirank, n.d.).

Under the UNESCO umbrella, **an annual SDG Research and Teaching Conference** could be held to foster the exchange of ideas and best practices deepening North-North, North-South and South-South exchange.[50] The conference would also serve as a networking platform between academic and interested industry, governmental and non-profit leaders. A new Global SDG Higher Education Professional Organization could be tasked with organizing the SDG Annual Research and Teaching Conference and producing the rating system. Each year at the conference the institutional Global SDG Higher Education Institution Benchmarking results would be announced and released.

Given the exigencies of global climate change and the increasing corporatization of higher education, institutions must refuse to engage in research that supports non-sustainable practices (for example the fossil fuel or other extractive industries), or to invest their endowment funds in support of these industries.[51] HEIs must plan for courses and 'lifelong learning' for all sectors of society to meet the increasing demand for competence related to the SDGs, both for the public and private sectors. HEIs must also actively engage in making statements and appeals to leading political or economic entities, and promoting science advice at top political levels to promote the SDGs.

50 An example for such an event is the International Conference on Sustainable Development (ICSD). The ICSD focuses on the broader remit of solutions favouring the SDGs (https://ic-sd.org/about/ [Accessed 30 August 2021]). The currently proposed annual SDG Research and Teaching Conference would focus explicitly on research and teaching in relation to these themes.

51 https://gofossilfree.org/divestment/commitments/ (Accessed 31 July 2021.)

CHAPTER 5
Recommendations

Higher education institutions (HEIs) have existed as providers of societal enlightenment and change over centuries, maintaining their role as free and critical institutions while also – to varying degrees – aiming to perform a service role within societies. [52] It is crucial to maintain and encourage these important roles, and enable HEIs to incorporate traditions of critical thinking with problem-solving activities, while also adjusting their role in the light of societal changes. The future of humanity and our planet is under pressure, and thus the need for critical thinking and societal change is more pressing than ever.

Over the last decades and especially in the context of the Sustainable Development Goals (SDGs), HEIs have increasingly come to be seen as crucial actors contributing to sustainable development through research and education, and also through active engagement with their local communities and with society more broadly. As a consequence, there has been a recent upsurge in HEIs wishing to relate their activities to the SDGs; this is motivated partially from the bottom up, by engaged and motivated students and scholars, and partially from the top down, by strategic plans and leadership incentives. Accordingly, there is already a rich literature from which to draw insights and inspiration. In this report we build on these, but also go beyond them by addressing the need for HEIs to have strong obligations to motivate change in society at large, taking a leading role in the transitions needed as humankind faces unprecedented challenges, and emphasizing that there is an immediate need for change to respond to this call. This also implies that HEIs need to think critically about their own practices, curricula and research, and to motivate their employees, students and society at large to do the same.

In accordance with its mandate, the report responds to this call and its challenges, and aims to address the interplay between research, higher education and sustainable development from a global perspective. We have sought to achieve this by following these key aspects of the mandate: (1) The 2030 Agenda calls for *deep social, economic and political transformation* to handle a broad range of societal and environmental challenges. (2) HEIs can provide a broad understanding of the changes needed, generated though *interaction between disciplines* from the humanities to the social and natural sciences, and also *educate new generations of scholars, workforce, professionals, and agents of change*, trained to understand and deal with these issues. (3) HEIs represent 'free' institutions for novel and critical thinking and hence therefore also represent unique intellectual spaces for openness to other ways of knowing, and for a rethinking of sustainable development even beyond the SDGs.

> The recommendations of this Global Independent Expert Group are not intended as a counterpoint to the ideals of curiosity-driven, basic research and academic freedom. Rather, HEIs should wherever possible facilitate and engage in activities that promote the SDGs. In fact, we argue that it is those very HEIs as free institutions that have the motivation to lead societal change wherever needed to achieve the SDGs.

The report is structured around three major themes, each with its own challenges. It was drawn up by separate working subgroups but read, commented on and approved by the entire group. As outlined in their chapters, they all deal with necessary transformations, not least through new ways and areas for cooperation and interaction. The individual SDGs themselves represent complex problems that require complex insights and solutions, and this is also true where the SDGs interact to build a sustainable future. This calls for new ways of interacting within and between HEIs, and between HEIs and different sectors of society.

This reflects the demand for new 'horizontal' cross-cutting initiatives and structures that encompass the 'vertical' structures (or silos) typically represented by faculties and institutes (Chapter 2: 'Beyond Disciplinary Boundaries for the SDGs'). Second, it points up the importance of incorporating different ways of knowing, wherever relevant to the SDGs. Needless to say, this is not intended as an argument against ideals of rational thinking and scientific

52 Given the nature of this text, this is merely a brief and simplistic account of the different types of universities and more broadly HEIs with their distinct functions and places in society, and of the multifaceted history of these institutions. For more extensive accounts see for example McCowan, 2016 and 2019; Perkin, 2007 and Shapin, 2008.

methods. Rather, it acknowledges the importance of 'knowing through difference' and the value of multiple traditions and knowledges within societies, many of which are supportive of sustainable practices (Chapter 3: 'Ways of Knowing'). Third, in a rapidly changing word, HEIs need to interact more extensively with local communities, society at large, private and public institutions and policy-makers, both to actively promote the SDGs, and to gain insights and feedback from other institutions and actors. This emphasizes reciprocal interaction, although the focus of the report is on how HEIs must seek a much more active role for policy-making and lifelong learning related to achieving the SDGs. In all branches of society and all scientific disciplines there is a demand for people to work actively with the SDGs, in the labour market in both public and corporate sectors (Chapter 4: 'Higher Education Institution Partnerships').

In addition to the work that is already ongoing, this report makes recommendations that are intended to motivate activities to support the SDGs by building on what has been done previously, while simultaneously working towards new structures and alliances.

In this last section we reflect on the implications of the development of the three main themes. After proposing ten general recommendations, we organize them around the three main functions of universities and HEIs, namely education, research and outreach/community engagement. In so doing, three core purposes of HEIs that are dealt with in this report are developed: the purpose of furthering sustainability, the purpose of fostering equity and inclusion, and the purpose of raising awareness and consciousness around the SDGs.

5.1 General framework for the recommendations

This report calls for universities and HEIs to become an active part of an agenda that has obtained the consensus of 193 countries and aims to solve some of the world's most pressing problems, as stated in the 17 SDGs. The United Nations Agenda sets 2030 as its target, but it is clear that achieving the goals will take much longer, and that significant progress will have to continue at least until the end of this century. **Prioritizing the SDGs therefore represents a long-term programme for HEIs.** In developing this long-term programme, it is important to visualize the future of the many generations to come.

When prioritizing the SDGs as an important part of their purposes and strategic activities, HEIs with their values and ethical principles may find significant areas in which to express them. Recognizing the value and quality of life for all humans requires **reaffirming a human rights-based approach to the education and research that we carry out.** This implies recognizing that respect for human rights for all is not possible unless we also respect and actively protect our natural resources and all forms of life, and constantly struggle against power relations that foster inequality and all forms of violence and discrimination. **It also implies a fundamental appreciation of the value of cultural diversity** and of the potential contribution of each of the different cultures in progressing towards these goals. **Equity and inclusion**, too, are values that stand out when embracing the 2030 Agenda, **and the commitment to leaving no one behind** becomes central. The contribution of HEIs is manifold: theoretical and philosophical, clearly ethical, and geared to removing barriers to sustainable societies and the greater well-being of all.

HEIs are diverse and respond to very different contexts and realities. The recommendations that follow derive from a clear awareness of this diversity. The Global Independent Expert Group acknowledges that there is no one-size-fits-all solution, and that each HEI has to analyse each recommendation according to its respective history, context and possibilities.

5.2 General recommendations

1. **HEIs have values and ethical principles. These should be brought to bear on the everyday life of the institutions.** They should be made explicit, and HEIs should be accountable for the consistency and congruence of their activities with those values and principles.

2. **Critical thinking is one of the main values of universities and HEIs.** They must maintain a critical outlook and constantly reflect on their mission and role within society.

3. **Sustainability should gradually become a core purpose of HEIs.** Embracing structural and cultural changes which place SDGs at the core of governance and management of HEIs is a crucial means to increase the impact and success of activities.

4. **Inter- and transdisciplinary activities in education and research that cut across the traditional discipline-based structure of HEIs are needed in order to face the complex problems of the world today.** These must be fostered, and structural barriers to their development removed. Incumbent forms of power and privilege that run counter to the SDGs must be challenged, as well as assumptions about the relative value of contributions from different disciplines.

5. There is a **need to introduce research activities into the curriculum** and have students participate in research projects that contribute to the fulfilment of the 2030 Agenda.

6. **HEIs should be more open to dialogue and engagement with diverse communities who have developed other ways of knowing** in general, and around sustainability in particular, and be prepared to share, with humility and in a horizontal manner, the scientific way of knowing. Opening up to diversity must occur within as well as between cultures.

7. To ensure diverse forms of knowledge are embraced for the attainment of the SDGs, it is **essential for higher education systems to put in place measures and policies to ensure equitable access, and to address the barriers faced by social groups** (for example, in contexts where men and/or women, individuals living with disabilities, or marginalized populations may be at a disadvantage, where there are geographical barriers, etc.). Ensuring a diverse population in HEIs, and one that is representative of broader society (for both students and staff), is the first step towards incorporating diverse forms of knowing.

8. **Contributing to opening lifelong learning opportunities to all**, which is mentioned as a key part of SDG 4, is also an area that should be strengthened in HEIs and is a promising avenue for epistemological dialogue.

9. **HEI partnerships with government, enterprise and the non-profit sector should be substantially strengthened** and oriented towards helping society to navigate towards a sustainable future for humankind and the entire biosphere.

10. **HEIs have a strong role to play in democratizing scientific knowledge and in creating awareness in all sectors of society** of the reasons behind the urgent need to radically transform how we relate to nature, produce and consume.

5.3 Education

1. **The ethical training of future professionals** in all the values that HEIs proclaim, including those related to fostering sustainable lifestyles and training advocates for sustainability and equity, should be explicitly addressed, discussed, critiqued and ideally adopted by the students.

2. **Because problems such as climate change, poverty and inequalities are complex, an interdisciplinary and transdisciplinary approach is needed to better comprehend them.** Educational programmes should be designed with an approach that transcends the disciplines and trains students to work together with persons with different expertise.

3. HEIs need to **incorporate SDGs as part of their teaching programmes** in a manner that goes beyond creating mere add-ons to their existing discipline-based curricula. Instead, HEIs should seek to highlight and enhance the articulation between the curriculum and the latent social and environmental issues of our time, both locally and globally. It is time for HEIs to make sustainability and SDG literacy a core requisite for all faculty members and students.

4. **HEIs need to increase efforts to encourage young minds to take up sustainability education and careers,** and continue to effectively communicate the immense benefits of sustainability in terms of economic growth, human well-being and a healthy planet.

5. **The required curriculum for a bachelor's degree should include courses in holistic ways of knowing, more inclusive approaches to human-community interactions, and respect for cultures and knowledge systems.** This may include advancing anti-racist pedagogy, supporting reflection on critical race theory, and decolonizing the curriculum.

6. **HEIs can work towards the diversification of languages used within their walls,** which is also a way of diversifying faculty and students. Awareness of languages and the knowledge that they contain is a powerful means of achieving intercultural education within institutions, and of projecting interculturality to the wider society. The role of HEIs in fostering language diversity, in strengthening local languages and in thus preserving traditional wisdom and ways of knowing has great potential.

7. **Teaching methodologies should gradually move towards incorporating more experiential and dialogic activities in contact with different sectors of society**, especially with those that suffer most from environmental deterioration, discrimination and social inequity.

8. **HEIs should foster student participation in shaping matters of education around sustainability.** The present generation of centennials is particularly aware of environmental problems and willing to engage in activities that develop commitment to sustainability goals.

9. **Faculty and professors should be an integral part of the needed transformation of curriculum and education.** To achieve this, HEIs need to engage in intensive debates, discussions and, when necessary, training, as well as offer greater opportunities for faculty and professors to participate in designing new educational experiences.

5.4 Research

1. The role of HEIs as institutions promoting critical thinking and social transformation has never been more important. **HEIs should, to a greater extent, promote research and initiatives to combat loss of nature, climate change and inequalities.**

2. **Universities, and more broadly HEIs, must move beyond traditional separations between basic and applied knowledge, and bring together truth-seeking and problem-solving.** There is a clear need to question the efficacy and capacity of knowledge produced, and its application to the solution of problems affecting our societies and our planet today, such as the ones covered in the 17 SDGs. HEIs must identify and increase their reservoir of knowledge around the SDGs.

3. **There needs to be acceptance of, and respect for, different theories, methods, and forms of knowledge that diverse disciplines identify, create and utilize, and for collaboration that ensures equal participation and contribution between actors.** In particular, the arts, humanities, and social sciences (AHSS) and knowledge production that couples human and natural systems are critical for addressing the SDGs. HEIs can instigate bolder and more inclusive institutional policies that support transdisciplinary research, scholarship, and creative practices across the professional life of faculty.

4. **Incentives around and support for research need to be reoriented** to encourage researchers to engage in equitable and collaborative SDG-related research. Indicators and performance assessments need to be recalibrated with collaborative research in mind, and data collection systems developed or upgraded to account correctly for the impacts of such research.

5. **Externally driven ranking systems of HEIs should be revised** to recognize the value of equitable and collaborative research as well as the pursuit of inter- and transdisciplinary approaches for the achievement of the SDGs.

6. **Progress towards an open science policy must be fostered.** Open science and open access (without fees either for authors or readers) are essential, diversifying the way universities and more broadly HEIs generate and disseminate knowledge, and diversify partners and audiences. The metrics used to gauge research output should also be part of this discussion.

7. In addition to the importance of interdisciplinary research for attaining the SDGs, **knowledge needs to be 'coproduced' to reflect the diversity of communities and practices.** To do so, it is necessary to advance and support more inclusive and equitable research design, operations, expectations and resource investments.

8. **Alternative research methodologies should be experienced and refined.** More action-based research and community-based participatory research is needed not only in the social sciences, but also in the natural and physical sciences. Our ways of knowing must include more holistic, contextual and grounded approaches.

9. **Research results should be much more actively disseminated, and efforts should be made to put them to use where appropriate for SDG-relevant purposes.** HEIs should more actively engage in multilevel 'science-based' political influence in the form of science advice and science diplomacy. This should take place both at the national and local level, and in coalitions at the international level, but could also take the form of direct, bottom-up incentives.

5.5 Outreach and community engagement

1. There is a clear need for **much more proactive outreach activities on the part of HEIs that allow for science advice for policy, advice on remedies or solutions, and engagement in societal projects oriented towards improving ecosystems, combating climate change and generating greater welfare in society.** The call is for HEIs to have a much wider voice in society. HEIs should interact across the full range of political, economic, legal and other societal sectors to promote sustainability, including advocacy, policy design, social experimentation, application of innovations and technology transfer.

2. **Lifelong learning opportunities should be expanded and make room for building awareness among the different sectors of society about the SDGs and sustainability issues.** This includes the rationale behind the SDGs, awareness of the expected consequences of not achieving them, and the ways ahead for individuals, collectives and organizations.

3. **Networks should be strengthened and expanded. Deeper collaboration and partnerships among academic, civil society and economic sectors of the nation are needed** for progressing towards sustainability education and the generation and implementation of solutions. HEIs should engage meaningfully in networking and alliances with others in society that strive for the same objectives, including traditional societies and groups subject to discrimination.

4. **Greater efforts are needed to reach a much wider and diverse population, with useful research results** that feed into clear scientific explanations and possible solutions to pressing problems. Expanding the number of free and open knowledge platforms has the potential to accelerate knowledge acquisition among populations unable to access higher education.

5. **Democratizing research, whereby local actors work together with HEI researchers in the cocreation of knowledge**, not only empowers communities to influence how research impacts them; it also serves as a mechanism for accelerating the realization of the SDGs. Community science, or citizen science, is a participatory research practice that favours democratization of research.

6. **Partnerships between HEIs in the global North and the South should be revised** to make sure that the planned collaborative projects are codesigned and fully aligned with the vision and mission of HEIs in the South, and well integrated into their strategic plan. Outcomes tied to the progress on SDGs should be incorporated in all structured partnerships. More equitable academic relationships between institutions in high-income countries and HEIs in low- and middle-income countries should be fostered.

7. **Partnerships should give priority to the objective of sustainable capacity-building.** Rather than offering scholarships for doctoral studies in OECD countries without considering the risk of brain drain, support for graduate programmes in the strongest local or regional HEIs could go a long way towards building the research capacity of HEIs in lower-income countries.

8. **Multilateral partnerships between HEIs, as well as strong networking among HEIs globally, particularly with the objective of favouring contribution and progress towards SDGs, have to be strengthened** and multiplied in order to make room for projects that cocreate knowledge and share diverse findings and methodologies around the 2030 Agenda.

5.6 Specific recommendations

During the course of our discussions, specific recommendations arose for concrete actions HEIs can take to overcome the barriers to embracing the 2030 Agenda, covering themes of sustainability, equity and inclusion, and global partnerships, among others. Among them we wish to highlight the following:

1. **Governments and institutions that foster quality assurance should give due recognition to the value of what is done and achieved by HEIs in promoting SDGs and in solving relevant problems by unconventional or interdisciplinary efforts.** The process of revising the criteria for ranking HEIs should include an understanding of the connection between HEIs and SDGs.

2. **New structures across faculties should be encouraged to ensure inter- and transdisciplinary units for broad promotion of the SDGs in HEIs**, making sure that incentives are in place for inter- and transdisciplinary education and research, as well as for relevant outreach activities and participation in networks and partnerships.

3. **Introduce compulsory courses in sustainability in all education programmes.** Better still, transversalize sustainability, that is, embed sustainability content and values in most syllabi.

4. **HEIs must interact more actively with the private and public sector and society at large to promote the SDGs.** This includes all levels from policy advice at top levels relating to sustainability, to interactive engagement with companies to citizen science. HEIs should seek cooperation with political spheres, the public, business and stakeholders to develop courses and research specifically devoted to or relevant for the SDGs.

5. The creation **of a Global SDG Research and Teaching Central Fund** could be relevant, to support the following elements: (1) Annual individual faculty grants (including graduate and undergraduate research advancement in order to develop capacity); (2) Annual grants for transdisciplinary, cross-institutional faculty research teams; (3) Grants for exhibitions that promote the public sharing of SDG knowledge; (4) Grants to advance training on SDG-related themes. Furthermore, a series of transdisciplinary 12-month SDG Fellowships should be instituted to facilitate and support faculty research and outreach. The SDG Fellowships would be offered to faculty on an annual basis.

6. Setting up a **Global SDG Higher Education Institution Benchmarking system:** unlike a ranking system that creates a competitive environment working from the top down, the Global SDG Higher Education Institution Benchmarking system would qualitatively and quantitatively compare how HEIs advance different SDGs across the three areas of research, teaching, and outreach/community engagement, with highest recognition given to those that holistically address a large number of SDGs across all their activities.

7. Under the UNESCO umbrella, **an annual SDG Research and Teaching Conference** could be held to foster the exchange of ideas and best practices, deepening North-North, North-South, and South-South exchange. The first of these conferences could involve concrete discussions among HEI leaders on the key recommendations of this report and their operationalization, and on how to urgently support their institutions in the necessary knowledge production and scaling up of collaborations to address the current global challenges. The conference would also serve as a platform for networking between academic and interested industry, government and non-profit leaders.

8. **Establish a transnational self-reflexive system,** in collaboration with funding agencies that provide grants, for HEIs to develop initiatives related to progress towards the SDGs. Then, HEIs would report back on their specific work and the projects they are implementing to advance the SDGs, and the outcomes would be compiled.

9. Sustainability should be anchored and monitored in HEI governance structures with an empowered and financed **Chief Sustainability or SDG Officer and/or a sustainability committee at the top level of the governing boards of HEIs.** That officer/committee should record their institution's stated vision related to sustainability and progress in relation to the SDGs.

10. Given the exigencies of global climate change and the increasing corporatization of higher education, **HEIs must refuse to engage in research that supports non-sustainable practices,** for example, the fossil fuel industry, or to invest their endowment funds in support of the fossil fuel industry.

11. HEIs should be leading examples to institutions and society in general on how to make sites and places sustainable. **States should recognize and encourage HEIs to certify sustainable institutions.**

12. **Space needs to be opened up for the emergence of HEIs specifically devoted to promoting the SDGs. These could for example be Indigenous, environmental,** institutions that challenge our conception of HEIs in ways that will positively refresh the higher education sector and offer a vision of what is possible.

13. **Funding should be allocated to improve the participation of under-represented population groups across disciplines in HEIs.** It is important to attribute such funding to students (for example, Ph.D. scholarships for females in STEM fields), as well as the hiring of faculty and researchers to ensure the presence of people from under-represented populations in fields where they are commonly under-represented.

14. Infrastructures for mass, quality distance education should also be developed in the South, with the same type of mentorship and training available for in-person education, to avoid the brain drain that pulls people from their home countries to be educated in the North. **Qualified teachers and experts could share their experiences in setting up infrastructures, as well as in educating students remotely.**

15. **Institutions in the global South need greater investment to boost the capacity of local researchers, research institutes and think tanks to avoid a South-to-North brain drain and allow lower-income countries to find sustainable solutions that match their needs.** In this regard, greater representation and engagement with researchers and students from the institutions in the global South at global academic conferences would ensure research and teaching meets and integrates the needs of those living in the global South, as well as strengthening North-South and South-South higher education systems and teaching collaborations.

16. **Joint decision-making for the design of collaborative projects between HEIs in the North and their counterparts in the South makes for a mutually beneficial agenda** that is aligned with the development needs of HEIs in the South. HEIs in the North should recognize the expertise in the South, and the fact that their counterparts in the South are more aware of the relevant local issues and research priorities.

Answering the call for HEIs to play an active role in achieving the 2030 Agenda and addressing the related challenges is an urgent task. In accordance with the mandate of this Global Independent Expert Group, this report considered the interplay between research, higher education and sustainable development from a global perspective. We have strived to do this, first, by developing the idea of working together for the SDGs, and making an argument for the need to move towards inter- and transdisciplinary education and research. Second, we have tried to communicate the importance of embracing the pluriverse and opening HEIs to a profound epistemological dialogue with other ways

of knowing and with different sectors of society, including those that have been marginalized from higher education. Third, we have stressed the importance of strengthening the role of HEIs in society and of pursuing a strong voice in policy and practice through potent partnerships and networks. These three areas of further development of HEIs have strong cultural, structural, and even organizational and financial implications. These final recommendations, therefore, are to be studied and debated not only by the HEI global community, but also by governments, funding agencies, civil society organizations and any other societal actors that can contribute to engaging HEIs in better fulfilling their role in working towards a more sustainable and just society.

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Andy Stirling is Professor of Science and Technology Policy in the Science Policy Research Unit (SPRU) at the University of Sussex. Among other projects, he has been co-director since 2006 of the ESRC STEPS Centre (on 'pathways to sustainability'). He has served in a variety of other roles including as SPRU Science Director (2006-2012) and Research Director for the Sussex University Business School (2009-2012). An elected fellow of the UK Academy of Social Science since 2017, he serves on the Sociology sub-panel of the 2021 UK Research Excellence Framework. With an MA in archaeology and social anthropology (Edinburgh University 1984), his doctorate is in science and technology policy (University of Sussex, 1994). Through the early 1980s, Stirling worked as a field archaeologist and ecology and peace activist. In 1985 he joined Greenpeace as a volunteer, going on to coordinate their international nuclear, disarmament and energy campaigns and serving between 1994 and 2016 on their international and UK boards. He has also worked variously as a building labourer, laboratory technician, hospital porter and factory, farm and mental health care worker. Stirling has worked in SPRU at the University of Sussex for more than 25 years as a transdisciplinary 'policy-engaged' researcher, teacher and policy adviser on the politics of science, technology and innovation.

Anna Davies is Professor of Geography, Environment and Society at Trinity College Dublin, where she is also the director of the Environmental Governance Research Group and is on the steering committee for the Trinity Centre for Future Cities. Her research examines socio-political and spatial aspects of environmental policy making, and she has worked on projects of various topics such as environmental planning and sustainable development, values and valuation of the environment, the politics of climate change, biodiversity, waste management, sustainability enterprise and sustainable consumption. She is presently the Principal Investigator of SHARECITY (2015-2021), a Member of the Royal Irish Academy (2017), and was founder and inaugural Chair of Future Earth Ireland. She advised the Irish Government as a member of the National Climate Change Council (2015-2021), is currently a Board Member of the International Science Council, and Chairs the Governing Board of the social enterprise The Rediscovery Centre: Ireland's national centre for the circular economy. Previous positions include Chair of The Planning and Environment Research Group of the Royal Geographical Society; Secretary of the European Roundtable on Sustainable Consumption and Production; founding member of the Future Earth Knowledge Action Network for Systems of Sustainable Consumption and Production; and Principal Investigator of CONSENSUS, a large-scale multi-institutional project funded by the Environmental Protection Agency focused on consumption, environment and sustainability.

Cheikh Mbow has a Ph.D. in Remote Sensing and Forestry from the University of Dakar and Copenhagen University, and from 2002 to 2003 he carried out his postdoctoral studies in Canada. He was appointed as the inaugural Director of Future Africa at the University of Pretoria in 2019, which is a platform to develop leadership in transdisciplinary research in Africa to address grand challenges that hinder shifts towards a future of the African continent that is prosperous, equitable and sustainable. He is also a Professor at the University of Pretoria's Faculty of Natural and Agricultural Science. Some previous positions include Associate Professor on remote sensing-GIS and climate change at the Institute of Environmental Sciences; Laboratoire d'Enseignement et de Recherche en Géomatique at the Polytechnic Faculty of the University Cheikh Anta Diop of Dakar; Professor at the Institute of Environmental Sciences at University Cheikh Anta Dop of Dakar, Senegal; and Senior Scientist on climate change and agroforestry at the World Agroforestry Centre (ICRAF) in Nairobi, Kenya. He has held many science leadership roles at the World Agroforestry center in Kenya and the START-International Secretariat in USA, and has been lead scientist in various regional and global programmes related to land degradation and climate change.

Dag Olav Hessen (co-chair) is Professor in Biosciences at University of Oslo. He has a Master of Science in biology and a Ph.D. in Biology, as well as a Bachelor's degree in Public Law, from the University of Oslo. In 1983 Hessen began as an assistant professor at the University of Oslo, and in 1988 he became a Research leader at Norway Institute of Water Research before becoming a full professor in 1993. Presently he is also head the Center for biogeochemistry in Anthropocene at the University of Oslo in the Faculty of Mathematics and Natural Sciences. Hessen's major interests include food web ecology and "ecological stoichiometry" in aquatic food-webs. Additionally, he has papers on genomic evolution and regulation of growth rate via rDNA and RNA in various organisms. Furthermore he has ongoing studies on climatic effects on element cycling and biota at high latitudes, however his current interest is carbon cycling in ecosystems and its bearings on climate. He also has a wide collaboration with social sciences, and has published some 25 popular science books related to humans in nature and human nature.

Helena Bonciani Nader is the head of the Institute of Pharmacology and Molecular Biology and professor at The Federal University of São Paulo (Unifesp). She has the rank of Scientist 1A in the Brazilian Council of Scientific Development and Technology (CNPq). Her research area of interest is molecular and cell biology of glycoconjugates. Presently, Nader is a member of the Brazilian Academy of Sciences (ABC), Latin America Academy of Sciences (ACAL), the São Paulo State Academy of Sciences, and The World Academy of Sciences (TWAS) for the advancement of science in developing countries. She is honorary President, former President (2011-2017) and Vice-President (2007-2011) of the Brazilian Society for the Advancement of Sciences (SBPC), and former president of the Brazilian Society of Biochemistry and Molecular Biology (SBBq, 2007-2008). She is Vice-President of the Brazilian Academy of Sciences and co-chair of the InterAmerican Network of Academies of Science (IANAS). Nader has been the recipient of many national and global awards and was even the first female at her university to become Pro-rector of Undergraduate, and Pro-rector of Research and Graduate programmes.

Jamil Salmi is Professor Emeritus of higher education policies at Diego Portales University in Chile. In the past 26 years, he has provided advice to governments and university leaders in about 100 countries on all continents. He gives policy guidance on system-wide tertiary education reforms, including vision for the future and national development strategies, excellence initiatives, system-wide governance, financial sustainability, quality assurance, institutional differentiation, system articulation, and equity promotion strategies. His work has also been dedicated to evaluation of national higher education systems and reforms, and evaluation of donor programs in support of higher education capacity building in developing countries. Salmi has organized and delivered leadership and strategic planning training for Ministry of Higher Education officials, university leaders, and leaders of other tertiary education institutions (non-university institutions, student loan agencies, etc.).

Melody Brown Burkins is the Director of the Institute of Arctic Studies at Dartmouth in New Hampshire, USA, where she also serves as Senior Associate Director in the John Sloan Dickey Center for International Understanding and an Adjunct Professor in the Department of Environmental Studies. Trained as a polar scientist, she works on multiple initiatives advancing the coproduction of knowledge with and for Arctic communities and focusing on issues of science diplomacy, sustainable development, and inclusion. She serves as Special Advisor and Assembly Member to the UArctic global network, Vice Lead of the UArctic Model Arctic Council Thematic Network, and founding member of the UArctic Gender in Arctic Knowledge Production Thematic Network. In addition to her work in the Arctic, Burkins holds a variety of prestigious international positions to advance global science cooperation, inclusion, and sustainability, including service as an elected member of the Founding Governing Board of the International Science Council (ISC), Chair of the National Academies' Board on International Scientific Organizations (BISO), Past Chair of the U.S. National Committee for Geological Sciences, and advisory board member to the United Nations' Office of Disaster Risk Reduction (UNDRR) Global Assessment Report (GAR). In the Arctic and globally, she works to advance a more inclusive and equitable society through the development of platforms for inclusive science policy and diplomacy. With a career spanning almost 30 years in both academic and governmental roles, Burkins is a strong advocate for cross-disciplinary, policy-relevant scholarship, investments in education, and investments in global cooperation and dialogue for peace.

Seeram Ramakrishna, *FREng, Everest Chair* is among the top three impactful authors at the National University of Singapore (NUS). He is the Chair of Circular Economy Taskforce. He is an advisor to the Singapore Ministry of Sustainability and Environment and also advises the World Bank. He is a member of ISO Committee on ISO/TC323 Circular Economy. He is also a member of the Singapore Standard Council WG on circularity of materials. Ramakrishna chairs the Sustainable Manufacturing TC at the Institution of Engineers Singapore. He is the Editor-in-Chief of the Springer NATURE Journal Materials Circular Economy. His book '*An Introduction to Circular Economy*' received the 2021 Springer Nature China New Development Award. Microsoft Academic ranked him among the top 50 authors out of three million materials researchers worldwide based on H-index, saliency and citations. He is named among the World's Most Influential Minds (Thomson Reuters), and the Top 1% Highly Cited Researchers in cross-fields (Clarivate Analytics). His senior academic leadership roles include NUS Vice President (Research Strategy); Dean of NUS Faculty of Engineering; Director of NUS Enterprise; and Founding Chairman of Solar Energy Research Institute of Singapore. He is an elected Fellow of UK Royal Academy of Engineering (FREng); Singapore Academy of Engineering; Indian National Academy of Engineering; and ASEAN Academy of Engineering and Technology. He received a Ph.D. from the University of Cambridge, UK; and The TGMP from Harvard University, USA.

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Tong Shijun became the second Chancellor of NYU Shanghai on June 1, 2020. A scholar of Western and Chinese philosophy, he served as an administrator and professor of philosophy at East China Normal University for more than 30 years, and as party secretary there from 2011 to 2019. Tong is the author of ten books in addition to many scholarly articles, translations, and joint publications. He is actively involved in international academic fora and is highly recognized by colleagues in China and abroad, particularly for his scholarship on critical theory and the works of contemporary philosopher Jürgen Habermas. Tong received his doctoral degree from the University of Bergen (Norway) in 1994. He has served as a visiting scholar at the University of Bergen, a guest professor at Philipps-Universität Marburg (Germany), a Fulbright Research Scholar at Columbia University, and a member of the Shanghai Academy of Social Sciences. In 2011, he was elected a Foreign Member of the Norwegian Academy of Science and Letters (Det Norske Videnskaps-Akademi). He is the recipient of numerous awards and honors for his teaching, research, and writing.

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Knowledge-driven actions: Transforming higher education for global sustainability

Independent Expert Group on the Universities and the 2030 Agenda

With the deadline of the 2030 Agenda fast approaching, it is essential to think critically about the necessary knowledge and transformations that are required to address the world's greatest problems. Of interest to higher education institutions and leaders, as well as governments, funding agencies, civil society and other relevant higher education stakeholders, this report emphasizes the paramount role of universities and higher education institutions in global progress towards the Sustainable Development Goals. Higher education institutions are uniquely positioned to contribute to the social, economic and environmental transformations that are required to address the world's most pressing issues. As such, it is pertinent to reflect on how these institutions should contribute to the 2030 Agenda, what stands in the way for them in doing so, and how these barriers might be overcome.

Prepared by the Global Independent Expert Group on the Universities and the 2030 Agenda, this report focuses on three interrelated themes: the need to move towards inter- and transdisciplinary modes of producing and circulating knowledge; the imperative of becoming open institutions, fostering epistemic dialogue and integrating diverse ways of knowing; and the demand for a stronger presence in society through proactive engagement and partnering with other societal actors.

Through an examination of various challenges and showcasing interesting and productive cases of ongoing higher education initiatives, the report calls on universities and higher education institutions to play an active role in achieving the 2030 Agenda. It aims to open up a conversation and to spark dialogue and urgent action of higher education institutions to support the attainment of the Sustainable Development Goals. Recognizing the urgent need for action and fair transition towards sustainability, it implores that the opportunity for higher education institutions to answer this call is now.

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4 Quality Education

Sustainable Development Goals