

Reforming higher education to sustain planetary health



The case for reducing carbon emissions to avoid catastrophic effects on global health is well known. The role of the higher education sector as a producer of carbon emissions has also been well documented.¹ In some countries, more than a half of the population attends university, with more attending other forms of higher education—the sector thus makes a heavy contribution to the population’s environmental damage. Although there are several laudable programmes to reduce the effect that universities have on the environment, there are features of the way that higher education is currently provided that reduce the possibility to make the required amount of change.

Limiting factors include insistence of the sector on face-to-face education with the requirements for carbon-intensive campus buildings and travel for both students and staff; insistence of the sector to attract overseas students to support university finances, with the associated emissions from travel and exposure to a more carbon intensive lifestyle than in students’ home environment; and failure to adopt new educational technology that reflects the way people learn today that could transform higher education while reducing its carbon footprint.

Among the initiatives to create a more sustainable environment for educational institutions is the

UN Higher Education Sustainability Initiative, in which five core areas of engagement with the Sustainable Development Goals include teaching, research, green campuses, international networks, and engagement with governments. However, students have called for more action,² and the student-led People and Planet publish an annual ranking of UK universities, which shows that most universities are not on track to meet even the few emission targets set by the UK Higher Education Funding Council.

Universities have a high carbon footprint due to buildings and travel,¹ and the academics’ propensity to travel to conferences.³ Several countries have a vigorous export industry for international students, which is associated with a large carbon footprint through international travel and frequent exposure to a higher carbon environment than in students’ home countries.⁴

Fundamental change is required to create an environmentally sustainable higher education sector.

A structural change towards a distributed university has been proposed.⁵ Its core feature is a pivot to online learning. Centralised university campuses would be downsized in favour of virtual or physical hubs, which can be distributed over geography to allow for regional and international access, and over time to allow for changes in learning needs over the life course (figure).

There is evidence that online learning can achieve similar outcomes to face-to-face learning;^{6,7} although, this might not apply to the rushed adoption of online learning during the COVID-19 pandemic. Some topics, such as the development of clinical skills, require face-to-face contact, and these are available through physical hubs in the distributed university. Societal change has seen the digital world expand. The internet of things, virtual reality, and other features of the fourth industrial revolution provide many opportunities for educational innovation. A pivot to online centred education is crucial to being able to take advantage of these opportunities.

Savings in carbon emissions are likely to be substantial. Online learning has been shown to reduce carbon emissions by over 80% compared with the physical version,⁸ with a large component due to travel reductions.⁹ A small cohort of 128 international students studying online rather than travelling to and living in the UK from their homes in Africa and India for a master’s course were estimated to have saved nearly a million kg of carbon dioxide.⁴ Further work is required to make accurate estimates of the carbon savings of a major pivot to online learning and the structural changes involved in the distributed university.

For more on the **UN Higher Education Sustainability Initiative** see <https://sdgs.un.org/HESI>

For more on **People and Planet** see <https://peopleandplanet.org/>

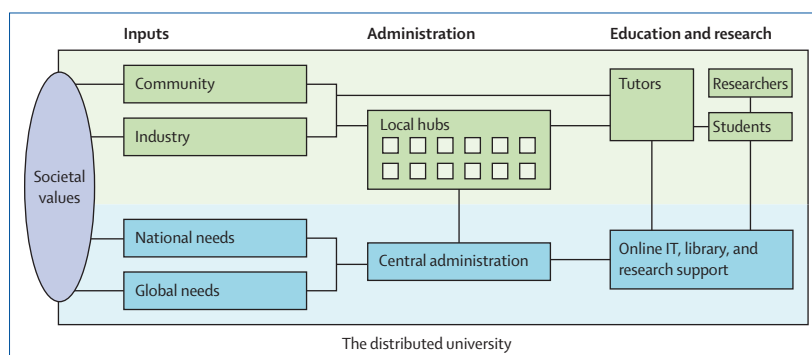


Figure: The distributed university
Reproduced from Heller.⁵

There are other advantages that could be unlocked through the distributed university. These include the ability to collaborate rather than compete between education providers, to help correct the global inequality in access to higher education, and to devolve management closer to the academics who are delivering and evaluating their educational programmes.

There are many other calls for the reform of university education, especially to recognise the new digital reality.¹⁰ The time has come for the need for reform to be taken seriously and for major structural change to occur. The environmental sustainability of the sector could be improved through these reforms and should be a driver of the need for this change.

I declare no competing interests.

Copyright © 2023 The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY 4.0 license.

Richard F Heller
rfheller4@gmail.com

University of Manchester, Manchester, UK; University of Newcastle, Newcastle, NSW 2308, Australia

- 1 Helmers E, Chang CC, Dauwels J. Carbon footprinting of universities worldwide: part I—objective comparison by standardized metrics. *Environ Sci Eur* 2021; **33**: 30.
- 2 Roca-Barcelo A, Gaines AM, Sheehan A, et al. Making academia environmentally sustainable: a student perspective. *Lancet Planet Health* 2021; **5**: e576–77.
- 3 Yates J, Kadiyala S, Li Y, et al. Can virtual events achieve co-benefits for climate, participation, and satisfaction? Comparative evidence from five international Agriculture, Nutrition and Health Academy Week conferences. *Lancet Planet Health* 2022; **6**: e164–70.
- 4 Heller RF, Sun YY, Guo Z, Malik A. Impact on carbon emissions of online study for a cohort of overseas students: a retrospective cohort study. *F1000Res* 2021; **10**: 849.
- 5 Heller RF. The distributed university for sustainable higher education. 2022. <https://link.springer.com/book/10.1007/978-981-16-6506-6> (accessed Dec 1, 2022).
- 6 US Department of Education. Evaluation of evidence-based practices in online learning: a meta-analysis and review of online learning studies. Washington, DC: Office of Planning, Evaluation, and Policy Development, 2009.
- 7 Schneider M, Preckel F. Variables associated with achievement in higher education: a systematic review of meta-analyses. *Psychol Bull* 2017; **143**: 565–600.
- 8 Caird S, Lane A, Swithenby E, Roy R, Potter S. Design of higher education teaching models and carbon impacts. *Int J Sustain High Educ* 2015; **16**: 96–111.
- 9 Versteijlen M, Salgado FP, Groesbeek MJ, et al. Pros and cons of online education as a measure to reduce carbon emissions in higher education in the Netherlands. *Curr Opin Environ Sustain* 2017; **28**: 80–89.
- 10 KPMG. The future of higher education in a disruptive world. Amstelveen: KPMG International, 2020.