Reforming higher education for sustainability: the Distributed University

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The role of the higher education sector as a producer of carbon emissions has been well documented [1]. In some countries more than one half of the population attends university [2], with more attending other forms of higher education - the sector thus makes a heavy contribution to the population's environmental damage. While there are a number of laudable programmes to reduce the impact of universities on the environment, there are a number of features of the way that higher education is currently provided that limit the possibility to make the required amount of change.

There are a number of factors in the current provision of higher education globally which limiting the ability of the sector to do more than provide a limited response to the need for adequate reductions in its carbon footprint. These include the dependence of the sector on face-to-face education with the requirements for carbon intensive campus buildings and travel for both students and staff, attraction of 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 and could transform higher education while reducing its carbon footprint.

Among the initiatives to create a more sustainable environment for educational institutions are the Higher Education Sustainability Initiative [3] whose five core areas of engagement with the Sustainable Development Goals include teaching, research, green campuses, international networks and engagement with governments. The United Nations Environment Programme has published the Greening Universities Toolkit [4]. However students have called for more action [5], and the student-led People and Planet publish an annual ranking of UK universities [6] which demonstrates that the majority are not on track to meet even the limited 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 [7]. A number of countries have a vigorous 'export' industry for international students – unfortunately for the environment this is associated with a large carbon footprint through international travel and exposure to a higher carbon environment than in their home countries [8].

If we are serious about creating environmentally sustainable higher education, radical change is required. A structural change towards a 'Distributed University' has been proposed [9]. 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 lifecourse.
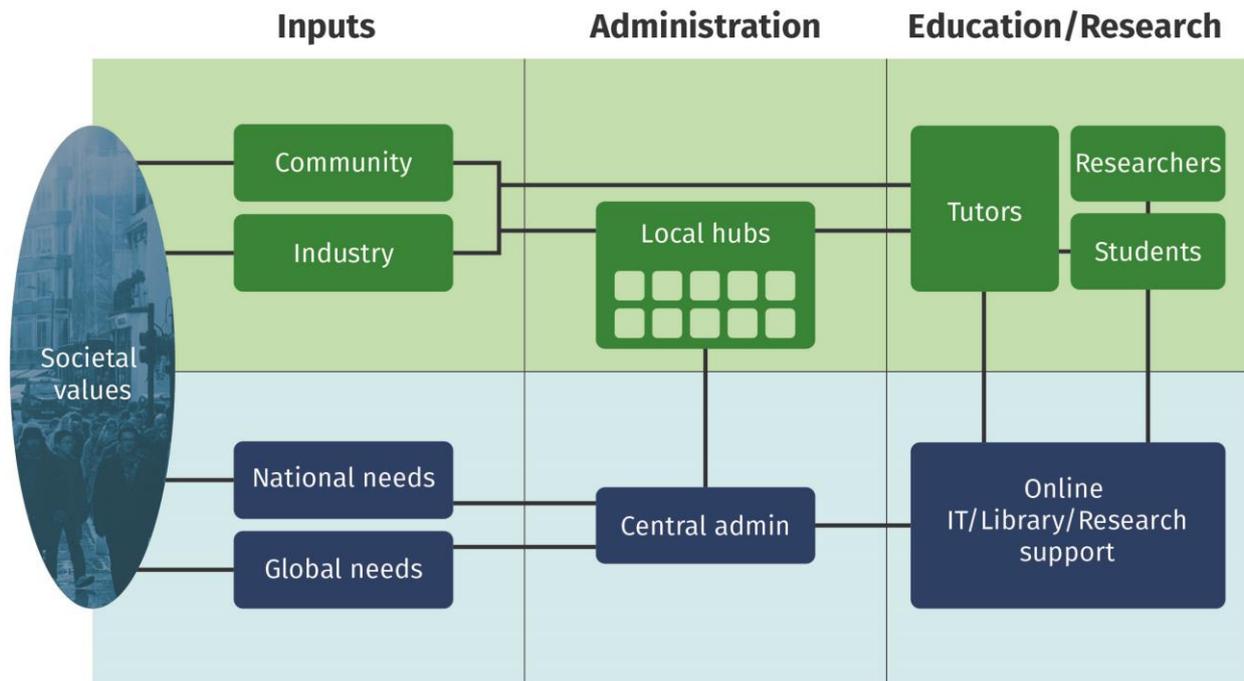
The Distributed University

There is evidence that online learning can achieve similar outcomes to face-to-face learning [10,11] although this might not apply to the recent rush to 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 though physical hubs in the Distributed University. Societal change has seen the digital world expand, and the Internet of Things, virtual reality and other features of the fourth industrial revolution provide many opportunities for educational innovation. A pivot to online education is central 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 [12] with a large component due to travel reductions [13]. 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 CO_2 [8]. 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.

There are other advantages that could be unlocked through the Distributed University, such as 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 [9].

There are many other calls for the reform of university education, especially to recognise the new digital reality [14]. 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 should be a driver of the need for this change.

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