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Pedagogies of Change

Rethinking the Role of the University
During the Climate Emergency

DAVID HUMPHREYS

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Pedagogies of Change: Rethinking the Role of the University During the Climate Emergency

David Humphreys,[1] Open University, UK

Abstract: This article presents some examples of teaching on environmental studies from recent Open University modules that encourage students to evaluate their role in responding to what should be seen as the greatest public welfare challenge of our age; global environmental degradation. This calls for a public education endeavour in its broadest sense, one involving not just the academy and students but the global public. Some universities in the UK have recognized that there is a now a climate emergency, raising the prospect of substantive changes to education governance, research and curriculum. Ecopedagogy offers the prospect of a new curriculum, a radical approach to education that resists the political and economic structures that generate environmental problems while working with social movements to generate an alternative environmental politics. It challenges those engaged in environmental education to rethink how they teach agency to students and what the role of the educator should be in equipping society to respond to environmental degradation. The article concludes that the recognition of a climate emergency suggests that universities should shift towards a more proactive ecopedagogical role as a matter of urgency.

Keywords: Agency, Climate Emergency, Curriculum, Ecopedagogy, Environmental Education

Introduction

What will be the history that is written of the twenty-first century? No one reading this article shortly after it was published in 2019 will be involved in writing this history but it will be written, and our actions and inactions today will help to shape that history and how it will be narrated. It is now clear that of the many challenges human society currently faces, none is as pressing as global environmental change. This is the defining public welfare problem of our age, and no other global challenge—be it migration, terrorism, global financial volatility, or armed conflict—approaches it in terms of severity, scope, and planetary scale consequences for ecosystems and human populations. When in another eighty years or so the first histories of this century are written, they will relate the story of how human society dealt with planetary warming. Will the history be that we knew our Earth was warming, but collectively failed to heed the warnings, like Nero fiddling while Rome burned? Or will the history be that, although we left it very late, we made the necessary changes: to politics, to corporate governance, to economic management, to technology, to industrial production and to education?

This article arose out of a concern about the enormity of the paradigm shift that human society must go through if we are to arrest global environmental decline and a recognition of the sheer scale of the imaginative leap that must be undertaken by all actors if problems such as global heating are to be arrested and reversed. While the momentum trends that generate unsustainability are clear enough—such as profligate resource use of minerals and fossil fuels, and huge inequalities of wealth and power that generate extremes of affluence and poverty, each of which generates their own distinctive patterns of unsustainability—the structural reforms that are necessary to arrest these trends are far less clear. In thinking through how society may generate the momentum trends for sustainability I focus on the area within which I work and operate: the university. Should universities change in response to the global environmental crisis? This article argues not only that there is much that universities could and should be doing

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[1] Corresponding Author: David Humphreys, Professor of Environmental Policy, Faculty of Arts and Social Sciences, The Open University, Milton Keynes MK7 6AA, United Kingdom. email: david.humphreys@open.ac.uk

differently, but that those who work in higher education have a moral responsibility to act in order to enable the citizens of the future to think through how they can use their agency to respond to the global environmental crisis.

The next section will argue that there is a growing imperative for university educators to act in response to environmental degradation. The following section takes the form of a review of recent literature published by some of the educators who are grappling with how they should respond to the environmental crisis. The article then reports on some teaching in environmental studies at the Open University. It argues that given current trends in global environmental degradation it is no longer sufficient just to teach *about* environmental issues; those who teach in this area must now equip students to *respond to* these issues.

An Imperative for Action

One Friday in August 2018 a fifteen-year-old girl from Sweden stayed away from school and demonstrated outside the parliament building in Stockholm. Greta Thunberg had decided to protest against the failure of politicians and business leaders to take action to reduce greenhouse gas emissions (Thunberg 2019). Photographs of her with her *skolstrejk för klimatet* (school strike for climate) placard were published around the world. Within just a few months a global "School Strike 4 Climate" movement had arisen in dozens of countries. It is the first transnational movement of a single generation in history.

This movement represents just one of a number of developments since mid-2018 that indicate a growing appetite for social and political change to address global heating. The movement Extinction Rebellion (XR), which has its origins in the UK but has also taken root in other countries, has held a number of high-profile demonstrations and actions, most notably in April 2019 when large areas of central London were closed down. One of XR's demands is that governments adopt a 2025 target date for carbon neutrality. This demand has a strong scientific basis following a 2018 report from the Intergovernmental Panel on Climate Change (IPCC) that humanity has just twelve years (i.e., by 2030) to put in place the necessary low carbon energy technologies if the more ambitious Paris Agreement target of limiting global heating to an increase of 1.5°C above pre-Industrial Revolution levels is to be achieved (IPCC 2018). The IPCC's warning was followed by a warning from the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES) that the rate of species extinction was increasing leading to an erosion of ecosystem resilience (IPBES 2019).

These scientific warnings have been backed by warnings from what may be termed public intellectuals. Nobel-prize-winning economist Joseph Stiglitz and journalist Naomi Klein argue for a "Green New Deal" to fund the increases in public expenditure that are necessary to catalyse the transition to a zero carbon economy (Stiglitz 2019; Klein 2019). In April 2019 British naturalist David Attenborough spoke to the International Monetary Fund in Washington, arguing that we are now living through the sixth great extinction of species (Attenborough, cited in Elliott 2019, 17). There is also a shift in how journalism reports environmental matters. In the UK the *Guardian* no longer reports on "climate change" or "global warming" but on "global heating" and the "climate emergency." The newspaper reports daily on the latest carbon count. As of November 2019 the carbon count was 410 parts per million (ppm), compared with a pre-Industrial Revolution count of 280 ppm. The scientifically-accepted safe limit is 350 ppm. Meanwhile the BBC has issued new guidance to its journalists on climate change reporting, accepting that inviting a climate change denier to provide a counterargument to the scientifically-accepted conclusion that anthropogenic climate change is taking place is an example of "false balance" (Carrington 2018).

All these developments—increased social demand through protest, warnings from scientists and other experts, and a shift in journalistic climate reporting—took place over a period of a few months between mid-2018 and early-2019. In the United Kingdom this led to the House of Commons recognising a climate emergency. Like other declarations, the declaration of a climate

emergency by the British parliament is not merely symbolic. It is an attempt to bring about social change and to will a new reality into existence. Declarations only have discursive power when others accept them as legitimate. The declaration of a climate emergency—one of the demands of Extinction Rebellion—by the House of Commons has been accompanied by similar declarations by the Scottish and Welsh Assemblies and over 100 local councils in the UK. Several British universities have now declared a climate emergency, including University of Bristol, University of Exeter, University of East Anglia, Lancaster University, and University of Glasgow. Such recognitions may have consequences for higher education institutions in three important areas. The first is on the corporate governance structures and environmental policies of higher education institutions. This may entail the implementation of measures to introduce renewable energy technology, to reduce the food miles and ecological footprints of campus catering, to introduce a target date for eliminating waste, to divest from fossil fuel companies and to carbon offset flights for academics making overseas research and conference visits. The second area is research. Responding to planetary heating may require a shift in research agendas to multidisciplinary research on, for example, new energy technology, emissions monitoring systems, political institutions, social changes and new governance structures to reduce carbon emissions and bring about the speedy transition to a low carbon society.

The third area concerns environmental curriculum: what universities should teach and how they should teach it. The environmental crisis raises profound questions on the purpose of environmental education. That is the subject of the remainder of this article.

Environmental Teaching on a Changing Planet: A Brief Literature Review

Whenever a problem is identified in society one of the first responses made is the need for improved education to address the problem. This is one of the responses to global environmental degradation. Sustainable Development Goal 4 (SDG 4) on Quality Education aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations 2019). There is a recognition that education needs to be strengthened to train a new generation of managers in the environmental consequences of business decisions, to provide technical skills training for the manufacture of low carbon energy technologies, and so on. But the inverse of the argument that improved education can enable us to respond to the environmental crisis also needs to be stated: that if global heating is persisting and worsening then part of the problem must therefore be that current education systems are not only unfit for purpose but are, in fact, contributing to the problem (Peake 2019).

This raises the possibility that our education systems help both to generate and to legitimize further environmental degradation. For example, law students learn the accepted legal principle that the fiduciary duty of the business corporation is to maximise shareholder value; business schools teach students how shareholder value and profits can be maximized, including through dumping environmental costs on society; and economics curriculum remains primarily focused on neoclassical economics in which such costs are treated as "negative externalities" rather than factored into the production process from the start. While many disciplines are responding to environmental problems through innovative scholarship, the question needs to be asked if overall our education systems train students more towards reproducing and perpetuating environmental problems, rather than arresting and solving them.

Both the need to reorient curriculum in order to produce graduates better able to respond to planetary degradation and the pressure on academics to perform their jobs often under tight time pressure each speak to a temporality of urgency, but in very different ways. The pressure to respond to environmental degradation is due to a rapidly narrowing window of opportunity within which action must be taken on a global scale before the effects of global heating reach catastrophic proportions. The work of most academics, however, is driven by a different temporality of urgency, one that is interior to their place of work: to publish research outputs that score well on citation metrics and to undertake heavy teaching workloads and administration

tasks (Berg and Seeber 2016; Back 2016). The speed with which many academics are nowadays expected to work due to funding cuts and increasing time poverty inhibits meaningful thinking time on what scholars should teach in order to address the public concerns that really matter to people and the natural world.

Research proposals increasingly speak to what Collini (2012) calls "Edspeak buzzwords." They must demonstrate that research is "impactful," "cutting edge," "innovative," "groundbreaking," and meets the needs of "users." The need to engage with "users" sets limits on the research that will be funded. It creates parameters of permissibility, ensuring that genuinely radical "blue skies" research that calls into question dominant ideas, values, interests, and power structures is rarely funded, with research proposals expected to cohere with the interests of designated groups, such as government agencies and their favoured business and industrial interests, if they are to pass the funders' peer review process. Such concerns are not unique to the United Kingdom and have been expressed in the United States, with one scholar arguing:

> As we in the academy begin to use business-speak fluently, we become accustomed to thinking in commercialized terms about education. We talk no longer as public intellectuals, but as entrepreneurs. And we thus encourage instead of fight the disturbing trend that makes education a consumer good rather than a public good. (Myers 2001)

This research culture prevents academics engaging in what Edward Said (1996) considered to be the most important duty of the intellectual; to speak on behalf of the public in its broadest sense. Said agrees with the work of French philosopher Julien Benda who in his book *The Treason of the Intellectuals* argued that civilization is possible only if intellectuals uphold universal principles, including standing in opposition to political power when this is necessary (Benda 2017 [1928]). To Said the public intellectual is "someone whose place it is to publicly raise embarrassing questions, to confront orthodoxy and dogma (rather than to reproduce them), and to be someone who cannot easily be co-opted by governments or corporations" (Said 1996, 11). Said would approve of New Zealand's Education Act, which gives universities a statutory duty to be "the critic and conscience of society" (Education Act, cited in Wolff 2018, 36). The public intellectual today can find no more pressing issue on which to speak than the need to preserve the ecological integrity and habitability of the Earth. However, the opportunity for intellectuals to criticize governments varies significantly according to the type of government. Hao and Guo note that in China intellectuals must abide by the unspoken principle of "obedient autonomy" according to which there are limits to critique; intellectuals can be "subversive," but only up to a point (Hao and Guo 2016).

Frank Furedi identifies what he considers a disturbing trend, namely the involvement of many students and academic staff in censoring and "no platforming" speakers, linguistic policing, and the coercive intolerance of those whose attitudes do not conform to accepted social norms. He terms this the "infantilization" of the university and views it as the proscribing of academic freedom (Furedi 2017). He maintains that "a serious higher education institution does not seek to limit academic freedom, but to affirm it…Universities have to reeducate themselves, and reappropriate academic freedom as the foundation of their work" (Furedi 2017, 186). Certainly an unbridled academic freedom is necessary if universities are critically to examine their own curricula and reconsider how teaching can empower students to respond to environmental degradation as informed citizens, consumers, employees and family members.

As Peter Dauvergne of the University of British Columbia, argues, "A spirit of outrage at the world order is necessary to move towards sustainability, not shrugging acceptance of extreme inequality, destructive growth, excessive business power, and a growing problem of consumption" (Dauvergne 2016: 152). Such a spirit also animates the work of Glen David Kuecker of DePauw University, who considers academic activism to be central to what we calls the "socially just academy" in which solidarity with the peoples suffering from environmental degradation should be central to teaching. Kuecker's pedagogy, in which "praxis is the guiding

principle," integrates research, writing, teaching, and activism (Kuecker 2009, 43). Kuecker sees solidarity as "a social relationship, a particular type of bonding between human actors" and a means of shifting from an "I" to a "we" narrative (Kuecker 2009, 45). Solidarity, he argues, shares common ground with radical forms of citizenship that seek to equalise unequal power relations, where those in positions of power, such as academics and students in economically developed countries, support those in less privileged position, such as communities suffering the appropriation of land and natural resources in the global South. This pedagogic philosophy has led Kuecker to take classes to Ecuador to show solidarity with communities suffering from the activities of Ascendant Copper, a Canadian mining company.

Kuecker notes that academic activism may have its limits. In some universities being "political" can destroy careers and weaken the chances of winning grant income. In the United States academics who seek to promote environmental and social justice may face a backlash from conservatives, such as David Horowitz (2006). Kuecker argues that universities in the global North are embedded within a political economy of capitalism. A constraint facing those who wish the university to adopt a more radical approach to environmental problems is that doing so may collide with some deeply entrenched interests. Business schools, which promote economistic values, are rarely seen as overtly "political" as they fit within the culturally hegemonic values of neoliberalism. However, academic activists motivated by ideas of social justice and engaging in a pedagogy of solidarity may be seen as part of a counterhegemonic project, and thus face resistance within and outside their places of work.

Kuecker had to deal with a strong attempt by Ascendant Copper to discredit him with De Pauw University. He notes that many scholars risk losing their careers "if a university's financial and symbolic capital is risked by academic activism" (Kuecker 2009, 53). This suggests that adopting a more proactive pedagogy may require scholars challenging power relations within our places of work; the university. After all, how much can we as academics achieve *without* the support of our institutions? And how politically controversial can universities afford to be, especially those that depend financially on funding from central government or business? Adopting a radical environmental pedagogy may be considered a perilous move by more risk averse educational institutions.

Richard Falk argues that academics spend too much time allowing their work to be limited by what he calls "horizons of feasibility", namely actions that can be taken within existing systems, rather than reaching for "horizons of necessity", namely those actions that are necessary to solve the ecological crisis (Falk 2016). Falk's two horizons bring to mind the seminal distinction drawn by Robert Cox (1986), and later applied to environmental problems by Lorraine Elliott (2004), between problem-solving approaches and critical approaches. Problem-solving approaches seek to solve environmental problems without questioning the foundational principles, values and power relations of social order. Such approaches are essentially reformist, advocating system adaptation to environmental problems, but no more than that. By contrast, critical approaches do not assume that environmental problems can necessarily be solved within existing systems and structures. Proponents of critical approaches go beyond system adaptation to argue for system transformation when this is necessary to solve an environmental problem (Elliott 2004). This distinction, drawn and applied, it should be recalled, by scholars, leads us to question whether fundamental and far-reaching reform of universities and other higher education institutions is necessary in order to ensure that the next generation of students is trained, able and willing to respond to planetary degradation.

Which pedagogies should be developed to do this? Karen Litfin has concluded that a purely cognitive approach to global environmental politics—namely an approach that aims to build student knowledge and understanding of, for example, international environmental treaties—can run the risk being too remote from students' everyday lived experiences. She argues for contemplative pedagogies that consciously work with emotions, including the "dark emotions" often stirred up environmental degradation, such as "fear, anger, grief, despair, and guilt" (Litfin 2016, 117). This requires greater reflection by students on their own relationship to the

environment, which Litfin captures with the tongue-in-cheek slogan "Don't just do something, sit there." She has found that students who confront their own anxieties, emotions, and confusions can operate with greater confidence in society.

Paul Wapner also argues for greater reflection in the classroom. He suggests that the skills, virtues and sensibilities that students need to respond to environmental degradation are not those traditionally associated with classroom teaching. He argues in favour of adding contemplative practices such as meditation, yoga and journaling to the "pedagogic toolbox" (Wapner 2016). Knowledge, Wapner insists, is not simply learning facts and theories and how to analyse, but also includes intuition, emotions, awareness and compassion. He acknowledges that often "academia belittles these ways of knowing, shunning them as the merely subjective dimension of human experience", but responds that "environmental problems are not simply technical dilemmas, but existential conundrums. They demand and engage our entire sense of self and species" (Wapner 2016, 70). He notes that "one's inner life affects one's outer engagements," (2016, 74) hence environmental pedagogy should not just be about the world out there but also about how we think and feel about the world and relate to it.

The perspectives of Wapner and Litfin relates to the idea of meaning. Emily Esfahani Smith (2017) identifies four dimensions to meaning: *belonging* (to a collective or community, and connecting with the world around us); *purpose* (what motivates us, what we want to achieve); *storytelling* (how we make sense of the world and of our lives); and *transcendence* (such as spirituality: that which moves us and makes us feel whole). All four dimensions could occupy a place within a revitalized environmental pedagogy. However, the subject of meaning is one that most university teachers consider to be outside their purview. Most educators "did not believe they had the authority or knowledge to lead students forward in this quest. Others found the topic illegitimate, naïve, or even embarrassing" (Esfahani Smith 2017, 8). Such entrenched attitudes within the scholarly community represent a significant constraint to innovating in environmental education.

Other constraints can be found in what Michael Maniates calls "myths" in environmental education (Maniates 2016). Myths act to restrict hope. Such myths include "The state prevails" (which limits hope by falsely suggesting that the state is the only actor we should look to for change); the "hegemony of complexity" (which limits hope by suggesting that environmental problems are so vast and complex they defy easy solution) and "If everyone does a few simple things we can change the world" (a myth which overlooks the importance of structural change and fosters feelings of guilt that may run counter to hope). By allowing such myths to go unchallenged environmental educators may unwittingly induce a sense of fatalism in students, suggesting that action to address the environmental crisis is hopeless. Hope, it should be noted, is not to be confused with naïve optimism ("everything will be OK"). Informed hope is neither defeatist nor optimistic but, rather, is an affirmative outlook that imagines and works confidently for positive change.

Arguably the most radical philosophy on teaching environmental issues is ecopedagogy (sometimes known as Earth pedagogy). Ecopedagogy is an emerging area of education that may be distinguished from environmental education. It is a critical pedagogy. As Antonia Darder explains:

> Unlike traditional perspectives of education that claim to be neutral and apolitical, critical pedagogy views all education theory as intimately linked to ideologies shaped by power, politics, history and culture. Given this view, schooling functions as terrain of ongoing struggle over what will be accepted as legitimate knowledge. (Darder 1995, 329)

The notion of critical pedagogy developed by Paulo Freire (2004) has served as an inspiration to a key theorist of ecopedagogy, Richard Kahn, who argues that ecopedagogy seeks "to interpolate quintessentially Freirian aims of the humanization of experience and the

achievement of a just and free world with a future-oriented ecological politics that militantly opposes the globalization of neoliberalism and imperialism" (Kahn 2010, 18). The transformative potential of ecopedagogy rests with its appeal to all citizens to promote change. Its values have been summarized as "educate to think globally; educate feelings; teach about the Earth's identity as essential to the human condition; shape the planetary conscience; educate for understanding; and educate for simplicity, care, and peacefulness" (Antunes and Gadotti 2005, 136).

Ecopedagogy should not be conflated with environmental education, although clearly the two overlap. Environmental education seeks to teach students about environmental degradation and to provide vocationally relevant teaching on techniques for dealing with environmental issues such as pollution control and integrated water management. Ecopedagogy, by contrast, seeks to teach students how to think through the problematic of global environmental degradation in its broadest sense and how to engage with and respond to this problematic as concerned, reflexive and active citizens (Table 1).

Table 1: Environmental Education and Ecopedagogy

Environmental Education	*Ecopedagogy*
Increase public knowledge about environmental issues	Increase the public capacity to respond to environmental issues
Critical analysis of different policy options and choices	Critical analysis of dominant economic and political power structures
Teach about politics but without advocating a political agenda	A political project with an agenda for transformative change
Accept that there are social limits to change (horizons of feasibility)	Insist that the social changes required to address a problem take place (horizons of necessity)

Source: Humphreys

Both environmental education and ecopedagogy seek to teach students to engage with environmental problems. But whereas environmental education seeks to teach students the skills of critical analysis in order to think through environmental problems themselves without advocating a particular course of political action, ecopedagogy has an overt political agenda. A basic premise of ecopedagogy is that environmental degradation is caused by the routine and everyday practices generated by unjust political and economic power structures that dominate nature for instrumental ends. Maintaining and restoring the integrity of the global ecosystem is paramount to ecopedagogy. Action within the lecture theatre and classroom is just one part of ecopedagogy's project. As well as working with educational institutions ecopedagogy also aims at social transformation working through grassroots social movements.

Ecopedagogy thus aims both to transcend and transform the more limited framework of environmental education (Kahn 2010, 152). Kahn insists that only a pedagogy that aims at the transformation of society, politics and economics has a chance of restoring and maintaining the ecological integrity of the Earth. Other pedagogies will either make no difference, or will contribute to the crisis by reinforcing anthropocentrism, instrumentalism, corporate globalization and overconsumption. He is especially critical of modern science and technology which he dismisses as "WMS", which denotes both "Western modern science" and "white male science" (Kahn 2010, 104).

Despite, or perhaps because of, its ambitious transformative scope ecopedagogy has attracted some criticism. Ecopedagogy's radical and critical edge risks setting it outside the education mainstream so that its transformative potential is marginalised. It can be argued that if

ecopedagogy is to be successful at empowering citizens to build a new constellation of political forces to resist environmental degradation then it is more likely to do so if it desists from openly presenting an agenda that will alienate public funding. Ecopedagogy has also been criticized for, thus far, failing to propose detailed changes to the curriculum or techniques for teaching, and thus offering a critique that "is simply too abstract" (Wapner 2011, 115). Despite this, ecopedagogy has the advantage of offering a philosophical approach on how the education sector can offer leadership in responding to global environmental degradation.

The next section will examine some recent cases of environmental teaching at the Open University. These fall primarily within the category of environmental education.

Environmental Teaching at the Open University

The Open University is a publicly-financed institution that is committed in its mission statement to educational opportunity and social justice. The Open University has a strong commitment to environmental teaching at the undergraduate and postgraduate levels and is committed to blended learning, with modules involving a multimedia mix of print resources and virtual learning environment (VLE) delivery including audio-visual resources, interactive activities, bespoke models and quizzes. The Open University is responding to environmental decline through a broad interdisciplinary curriculum that seeks to empower students to reflect on how they can respond to environmental issues with the result that there is now more teaching on how students can exercise their agency—their capability to make a difference in the world—in response to environmental problems relative to a decade ago. Environmental teaching spans the Faculty of Arts and Social Sciences (FASS) and the Faculty of Science, Technology, Engineering and Mathematics (STEM).

Scientific research at the OU since the mid-1970s has led to technological innovation that has contributed to the decarbonization of the UK energy sector (Peake 2019). The university also has a leading record in teaching low carbon energy technologies and other STEM-related environmental curricula. This section, however, concentrates on environmental studies teaching led by FASS. The section provides four examples of environmental teaching from the Open University in the areas of international negotiation, food consumption, climate science and greening the future. Teaching in all areas aims to encourage students to think through the causes of environmental degradation, to reflect on how the exercise of their agency may contribute to such degradation, and to consider how they may use their agency differently in the future.

Environmental Negotiation

The first OU module to include a live synchronous negotiation simulation was the Masters module *Negotiating Policy in a Global Society*. This module, which aimed to teach students "real world" skills that can be used in policy-relevant contexts, set out to teach negotiation as an essentially collective activity based on the relationship between theory and practice. Students were assigned the role of country delegates at the United Nations (UN) negotiating an international environmental agreement on forest conservation. Negotiations were conducted online using a bespoke document application that mimicked UN text negotiation procedures and conference diplomacy. The rooms included a plenary room, three working group rooms and the corridor (Figure 1). All negotiations took place online. There was no face-to-face interaction on the module.
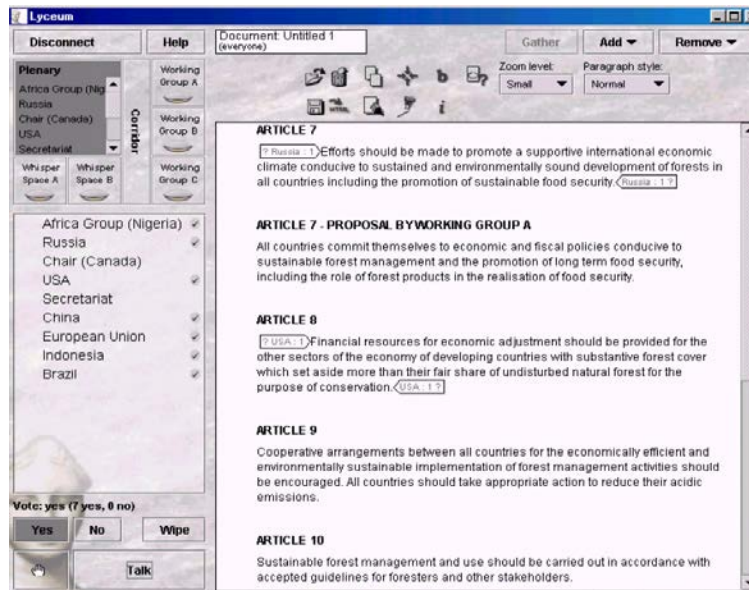
Figure 1: Online interface for the Open University Masters module *Negotiating policy in a global society*.
The text under negotiation is in the main pane. The Plenary room is grey, indicating that the user is in this room.
The "Yes" button is greyed showing the vote of the user. Ticks indicate actors who have voted "Yes".
The vote tally is in the bottom left hand corner.
Source: Open University

When negotiating text at the UN, any delegates can propose new text, and any delegate can dispute text. Text is disputed by inserting square brackets, with an open [sign at the start of the offending text, and a closed] sign at the end. Where *x* pieces of text have been disputed there will be *x* pairs of square brackets. Clearly this system would not work electronically, as the software would be unable to determine which [sign relates to which] sign. The module team thus developed the idea of dispute tags. Each tag is uniquely numbered and carries the name of the disputing country. In Figure 1 it can be seen that Russia is not prepared to accept the current draft of Article 7. As the plenary could not agree on Article 7 further negotiations on this article took place in Working Group A, which has proposed a new formulation (Figure 1). Following research conducted at the United Nations Forum on Forests, the simulation was designed to include informal discussions between delegations (Table 2). Informal interactions play an important but often unacknowledged role in forging agreement in international negotiations.

Table 2: Informal Dynamics of Negotiation and Their
Incorporation in the Negotiation Simulation

Informal dynamics of multilateral negotiation	*How these dynamics have been incorporated in the negotiation interface (Figure 1)*
Many important deals are brokered informally in "the corridors".	The Corridor is a public space where any delegate can participate in informal discussion.
Private whispered discussions frequently occur during multilateral negotiations.	There are two Whisper Spaces. These are private spaces at the rear of the Plenary. Delegates can converse privately while continuing to observe modifications made to the text in the Plenary room.
"Who is talking to who" is an often hidden dynamic of multilateral negotiations. Keeping track of this can provide clues to the sort of deals being brokered.	At the bottom of every room (except the Plenary, where occupants are listed separately, and the Corridor) is an "eye". When a student clicks on the "eye" a drop-down list appears of all occupants in the room.

Source: Humphreys

The module taught negotiation and political theory by enabling students to play two distinct but interconnected roles: that of the academic using theory to analyse and explain a political process; and that of the delegate using theory to advance their interests within a political process. The module made explicit the iterative relationship between theory and practice (Figure 2). Theory was taught using conventional print resources (selected readings on negotiation theory and international relations theory, and a study guide). Students were guided to use and experiment with their understanding of theory in the real time "laboratory" of the simulation.
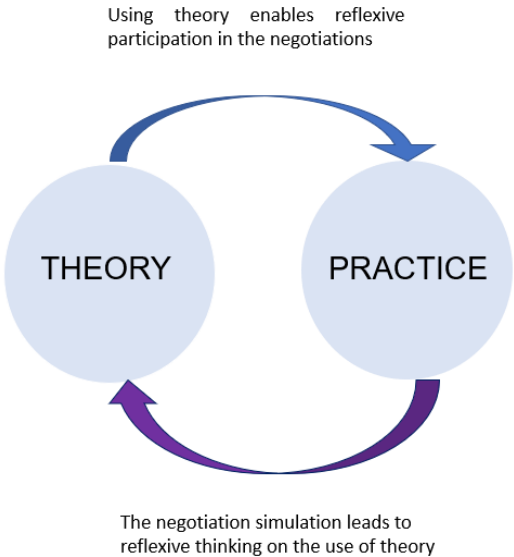

Figure 2: The Iterative Relationship between Theory and Practice in a Synchronous Role Play Simulation
Source: Humphreys

Students thus had to work with two roles, "taking off one hat" and "putting on another" during the module. They had to understand the relationship between the two roles, while practice keeping them separate. Furthermore, they needed to develop an acute awareness of how exercising their agency as delegates may change what they analyse. The role of the negotiator was taught as similar to that of the financial speculator. Speculators must understand market movements dispassionately and objectively. They must make observations, then analyse them to consider whether any trends are discernible. In so doing a speculator will seek to discern which way the market is moving, and whether they should buy or sell. But by entering the market a speculator ceases to be a disinterested analyst and becomes a participant with a stake in future movements (Soros 1998). Furthermore, the market player must be aware of how the exercise of her agency will change the behaviour of other actors and thus affect the trends observed earlier.

The simulation enabled student to understand the interactive dynamics of negotiating. It is impossible to capture this using conventional reading resources. The simulation provided a framework for situated learning by embodying the principle that learning is a social activity. At the start of the simulation the collective knowledge of the participants is unevenly distributed and dispersed among delegates. This changes as the simulation progresses. Negotiation involves both conflictual dynamics (with each delegation promoting their self-interests) and cooperation (as all shared a common interest in reaching an agreement). If there is to be a negotiated settlement some coordination between delegates is needed, and this can only take place through interaction and mutual discovery.

This module is no longer offered by the Open University. However, its teaching methodology on the dual use of theory to both explain and to inform practice has informed subsequent teaching on agency in other Open University environment modules.

Food, Diet, and Environmental Education

The second level undergraduate module *Environment: Sharing a dynamic planet* seeks to teach students about environmental issues and how they may respond to them. It comprises six blocks, each of which is guided by a block question. The question for the penultimate block is "How can we make a difference?" Students are taught about the environmental consequences of industrialised food production and how shifting diets may generate new patterns of global environmental degradation. For example, the increased global demand for meat in many Asian countries is leading to increased conversion pressures on tropical forests (Union of Concerned Scientists 2011).

Students are taught to analyse their diets over a four week audit-evaluate-act (AEA) exercise (Jehlička and Appleby 2013). Auditing takes the form of exploring the reasons for dietary choice, such as convenience, culture, personal values, money and lifestyle. Evaluation requires research on the environmental consequences, or the "foodprint", of dietary choice. Finally, action involves an examination of the measures that students can take by changing how they exercise their agency to reduce their foodprint. Students triage their action in one of the following categories:

A: Actions that are easy to carry out, although their environmental gains are small.

B: Actions that are easy to carry out, and will realise significant environmental gains.

C: Actions that would realise significant environmental gains, but which are difficult to carry out.

D: Actions that are difficult to carry out and which, if achieved, would realise only small gains.

Clearly in environmental terms there is little to be gained in targeting actions that fall under A or D. Actions under B will realise significant benefits for little effort. Actions under C are difficult, and cannot be carried out without significant structural changes. The teaching stresses that change should be imagined not simply as individual changes, but also scaling up so as to

generate broader social change through, for example, social networking, farmers' markets, reducing food miles and supporting ecolabelling schemes.

Climate Science

One of the most significant constraints to more effective actions to address global heating is organised climate denial, including the broadcasting of denial propaganda masquerading as journalism (Channel 4 2007). When producing the Open University's third level module *Environmental Policy in an International Context* it was decided to teach this subject area using a discourse analysis approach. Teaching focused on two discourses that are prominent in climate change politics; one arguing that anthropogenic climate change is happening (the discourse of the Intergovernmental Panel on Climate Change), and the other arguing that it is not (a discourse propagated by a small but well-organised and well-funded group of deniers active in the United States and Europe). Teaching on epistemology was used to show that the IPCC conclusions have a firm basis in scientific reasoning and evidence (not withstanding some scientific uncertainties on the speed and scale of change), while the denier arguments have no such basis.

After being introduced to the two discourses students are then directed to an online model produced in collaboration with climate scientists at the University of Reading and the UK Met Office. Because climate scientists seek to confirm the accuracy of a model by seeing how well it will simulate the past, the Open University model comprises two parts. The first, "Simulating the past", models the global temperature record based on known changes in greenhouse gas emissions. Students can work with various controls, running different data sets and varying climate sensitivity and the indirect aerosol effect. They can then compare the model's simulations with the empirical record since 1850 and see that, notwithstanding some differences, the model closely tracks the empirical record (Figure 3).
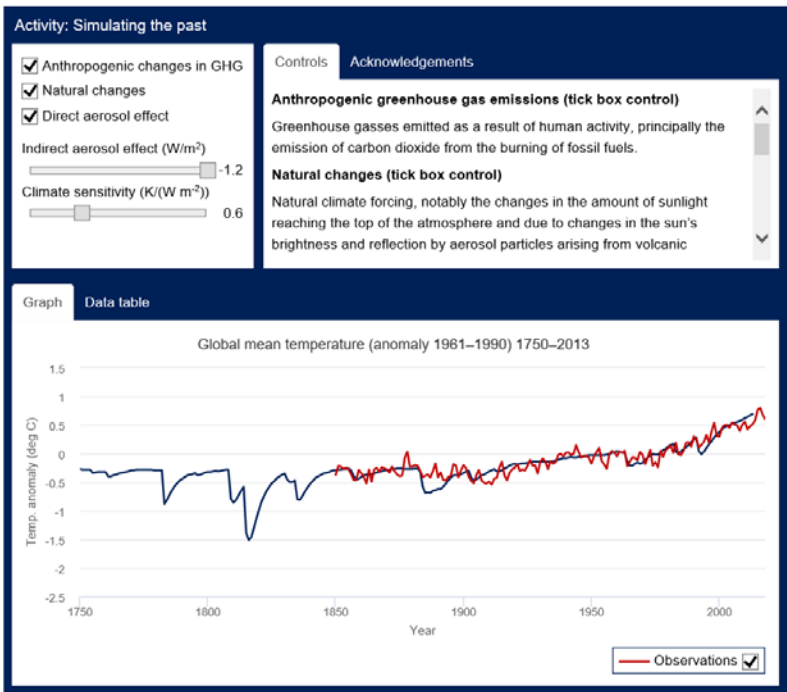

Figure 3: Climate Model Part 1: Simulating the Past
Source: Open University

The second part of the model, "Predicting the Future," shows the predicted changes in the global temperature until 2100 based on various greenhouse gas emissions scenarios this century, ranging from optimistic to worst case scenario (Figure 4). These scenarios use the data of the representative concentration pathways (RCPs) of the IPCC's Fifth Assessment Report (IPCC 2013). For all scenarios the model predicts a temperature rise, although the scale of the rise varies.
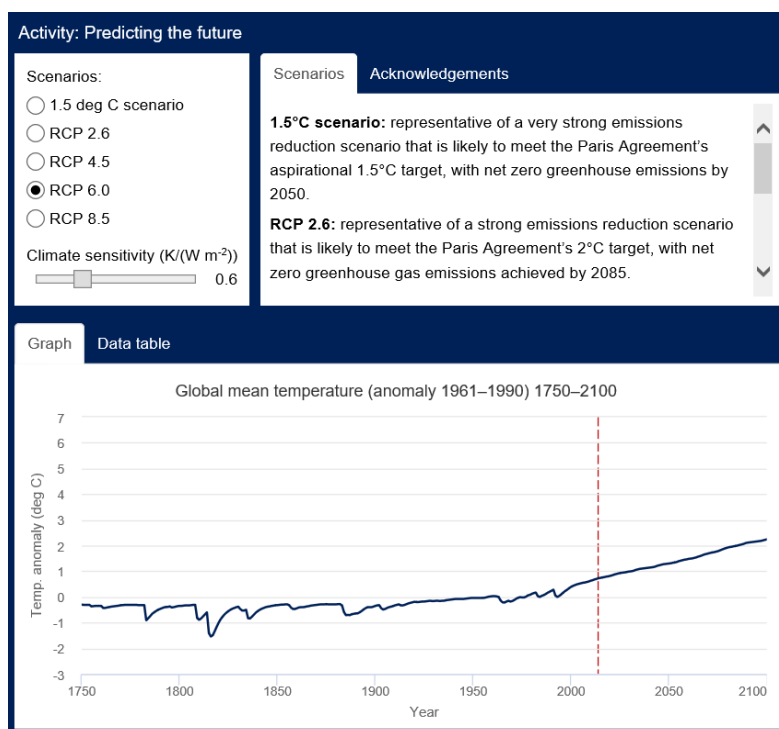

Figure 4: Climate Model Part 2: Predicting the Future Using IPCC Representative Concentration Pathway (RCP) 6.0
Source: Open University

The material on climate science also teaches the clear difference between scientific objectivity (the positivist notion that the researcher should eliminate bias and be detached from the object of her research) and journalistic objectivity (giving more or less equal media space to a debate). In so doing it notes risks to the public understanding of science through the democratic principle that both sides of an issue should be debated, with equal media space given to the views of climate scientists and climate deniers, thus providing the misleading illusion of a debate between two equal views (Boykoff and Boykoff 2004; Humphreys 2019).

In short, the teaching on this subject in *Environmental Policy in an International Context* is multimedia and interdisciplinary. It sets out to address an area of concern on how a vociferous group of climate deniers are impeding the public understanding of science and gives the students the conceptual tools to arrive at an informed understanding both of science and of the science-politics interface. The same module also aims to provide students with a conceptual tool kit to consider policy options for "greening the future."

Greening the Future

Environmental Policy in an International Context is first and foremost a course about environmental policy; how it is made, the values and interests it reflects, and why contemporary environmental policies are not more effective. It thus fits firmly within the purview of

environmental studies (Table 1 above). However, when producing the module the academic team involved were mindful of the ecopedagogy debate, and were keen to encourage students to engage in critical evaluation of the options for the future, thinking not just in terms of what can be done (horizons of feasibility) but also what should be done (horizons of necessity) (Falk 2016). Cox's (1986) distinction between problem-solving approaches and critical approaches is introduced and the module concludes with a study block on "Greening the Future." This comprises three weeks in which students are encouraged to think creatively on more radical and innovative policy responses that can meaningfully address the environmental problematic before tipping points in the Earth's biosphere lead to runaway global heating.

The first week, "Greening the Economy," moves beyond neoclassical economics to examine ecological economics. The work of Kate Raworth (2017) is harnessed to consider what a theory of economics would look like if it did not carry with it the legacy of ideas from the past, but instead started with a concern for society's long-term goals, designing economic theories to enable society to achieve those goals. The second week, "Greening the State," examines how the state would be designed and function if the ideological driving force of government was not neoliberal capitalism or economic growth but the conservation and enhancement of the global biosphere (Death 2016). The final week, "Greening Citizenship," examines the argument that notions of citizenship should be expanded to include rights of nature. It is argued that nature's rights should be recognized and respected both for moral reasons (because it is right that we do so) and for instrumental reasons (because ultimately all human rights flow from nature, and only by respecting these rights can human rights be realized). These three weeks represent the end of the module, which thus closes by confronting the inadequacy of existing environmental policies and challenging students to consider an alternative politics in which the conservation of the environment and nature are core.

Conclusion

Einstein is credited with saying that a problem cannot be solved using the same level of thinking that created it (Icarusfalling 2009). When thinking through social problems those of us who work within the academy have a crucial role to play. But we should not be content solely to criticise others; we also need to turn the spotlight on what we ourselves do, and how we can improve when circumstances dictate this is necessary. University education needs to innovate and be guided less by legacy ideas and teaching models, and more by innovative pedagogies animated by the exigencies and necessities of the warming world we how inhabit. There is no longer any doubt that global heating is happening, and that it will significantly worsen as the century unfolds.

The climate emergency therefore challenges universities to redefine how scholars should engage with the broader world. A central focus of university curriculum, at least in the UK, is employability skills. But employers are just one subset of society, and many employers engage in resource-based extraction and land conversion activities that degrade the natural world. While the focus on employability skills-based education must remain, it needs to be reinvigorated to equip employers with the skills necessary to deal with global heating. And it needs to be accompanied by a new approach that promotes skills that engage with the social world in its broadest sense, addressing environmental and social public goods questions.

This article has suggested some ways in which universities can change. We need to find new ways to teach the intergenerational dimension of sustainability, in terms of causation, legacy, responsibility and action. It has been suggested that purely disciplinary, or even interdisciplinary, approaches to environmental education need to be problematized. Environmental educators need to be prepared to engage with areas with which they may feel uncomfortable, such as emotion, sentimentality, spirituality and meaning. And there is a need to shift from teaching solely about environmental problems (environmental studies) towards how to address their deep structural causes (ecopedagogy). In the United Kingdom academics are increasingly considering how to

respond to global heating, with some universities declaring a climate emergency and rethinking their mission and agenda.

Agendas in education are not always explicit. Scholars in disciplinary areas such as economics and business studies have had a vast impact on social life through influencing politicians, policy makers, business executives and financial elites. They have had a profound influence on social discourses, shaping what is considered normal, routine and socially acceptable. Environmental scholars have so far had considerably less influence on how society is governed, or even on environmental decision making within their own universities. However, there is a precedent of British universities previously joining forces to take a shared principled stand, namely in 1998 when vice-chancellors agreed they would no longer accept funding from tobacco companies for cancer research (Monbiot 2013). Admittedly there are risks to universities taking an environmental stand and shifting their business models to address global heating; but there are significant risks in continuing without change, including the growing risk of irrelevance.

Ecopedagogy offers the prospect of a new curriculum, a radical approach to education that stands in opposition to the political and economic structures that drive environmental degradation while working with activists and social movements to generate an alternative environmental politics. It challenges those involved in environmental education to rethink the role of the educator in teaching citizens to think through how society should respond to the growing likelihood of catastrophic planetary change.

As with most universities, teaching on the environment at the Open University currently falls primarily within the domain of environmental education rather than ecopedagogy. That said, the two areas are not mutually exclusive. An environmental education curriculum may gradually shift over time and incorporate elements of ecopedagogy. Any curriculum is situated within an historical social context and should be justified and judged in relation to how it engages with the pressing social problems of its time. This then raises the question of what environmental scholars should do in response to the climate emergency. Recognising the climate emergency suggests universities should now shift towards a more proactive ecopedagogical curriculum as a matter of urgent necessity. Might ecopedagogy cease to be a matter of curriculum choice and become a pressing moral imperative?

Acknowledgements

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ABOUT THE AUTHOR

David Humphreys: Professor of Environmental Policy, Faculty of Arts and Social Sciences, The Open University, Milton Keynes, UK

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