2 Flowers of resistance

Citizen science, ecological democracy and the transgressive education paradigm

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... who are you, then? I am part of that power which eternally wills evil and eternally works good.

— Goethe, *Faust*

We have every reason to think that whatever changes may take place in existing democratic machinery, they will be of a sort to make the interest of the public a more supreme guide and criterion of governmental activity, and to enable the public to form and manifest its purposes still more authoritatively. In this sense the cure for the ailments of democracy is more democracy.


Prelude

When the editors of this book asked one of us (Arjen) to contribute to this collection in June 2016, it was a different time. Even though Donald Trump had become the presidential candidate for the Republican Party, not many people believed he would actually become president of a major world power: the United States of America. This chapter was to be mainly about the transition movement that seemed to be gaining strength in science and society. In science, sustainability science, post-normal science and science-in-transition was gaining strength representing a recognition of multiple ways of being (ontological pluralism) and knowing (epistemological pluralism) and the inevitability of persistent complexity, ambiguity and uncertainty. In society the call for living more lightly and equitably on the Earth was leading to transitions in energy (away from fossil fuel and centralized energy systems), food (away from agri-business and industrial farming towards more localized and sustainable food systems), economics (away from profit and growth oriented capitalist systems towards economies of sharing and meaning) and health care (away from centralized and privatized care systems towards localized cooperatives). Using a recently ISSC-funded project on ‘learning’ as a backdrop, the chapter would present these transitions as ‘learning-based transitions’ that would also require a transition in education. It would focus on what such education might look like in terms of its processes, design and outcomes.

But then the seemingly improbable happened: Donald J. Trump was elected president of the United States on November 8, 2016. His election was a major disruption in the sense that it unveiled serious shortcomings in ‘modern’ democracy,
the role of social media, the press and, indeed, the use and misuse of science in general and facts in particular. The chapter needed to be re-considered in light of this historic world event that could become what we might call a negative tipping point that could trigger a spiralling towards the abyss where *Homo sapiens* will join many other species in becoming endangered. The political events in the United States make clear that this chapter would also have to address the idea of democracy and to discuss the political nature of change. By inviting critical education philosopher Michael Peters to join in the writing of the chapter, the chapter brings these twin concerns to the fore. Still the chapter focuses on transformative and even transgressive education and research in the context sustainability transitions and possibilities that did not die with Trump’s rise to power, and may in fact crystallize into new forms of green solidarity once the world has recovered from the inadvertent and improbable election of the oil and gas, anti-environment, climate change—denying U.S. president.

**Post-Paris challenges**

After the diplomatic achievement of the Paris agreement in 2016 when against the odds a number of accords were put in place acknowledging the desperate need for immediate global action on carbon transmissions, the international green agenda has suffered a major setback with the election of Donald Trump. Threats of U.S. withdrawal from the Paris agreement signal how much painstaking effort is required to engineer a small concerted global step forward and the asymmetries of power involved when one man exercising executive power can overturn twenty-five years of effort in a single day. Trump’s anti-environmentism has unfolded quickly with a 30 per cent cut of the Environmental Protection Agency (EPA)’s budget and the appointment of Scott Pruitt, a climate-change sceptic, to oversee its downgrading. Already the EPA has been directed by an Executive Order to review and then rescind the 2015 Clean Water Rule. The green movement and agencies await Trump’s Executive Order on climate change. There is little doubt that Trump’s ascendancy represents the triumph of the world oil and gas industrialism that makes sworn buddies of old Cold War enemies to threaten pristine environments like the Arctic region in a regime of unrelenting oil exploration, drilling and oil production.

Economically *and* politically, the shift represents a reassertion of oil and gas global capitalism where Trump’s presidency provides the perfect vehicle for the robber barons to take back what they consider they have lost under the reign of global liberal internationalism. It is a calculated assault on the institutions of liberal environmentalism, although the courts still remain a vehicle of maintaining the green public interest. This represents a fundamental axial shift that makes oil buddies of Trump and Putin, signified by the appointment of ex-CEO of ExxonMobil Rex Tillerson’s appointment as Secretary of State.²

Despite Obama’s late ban of oil drilling in the federally owned areas of the Arctic and Atlantic to protect the unique Arctic ecosystem, a Republican-controlled Congress may yet be able to rescind the law, viewed by some as a last-ditch attempt by Obama to protect his climate-change legacy against Trump’s climate-change—denying cabinet and his promise to renege on the U.S. commitment to the Paris agreement.

Trump’s plans also have huge consequences for the coming ‘environmental wars’ at home and abroad when he lifted the moratorium of coal and began to dissemble the EPA. Hydraulic and gas fracking will be encouraged; in addition Trump
eliminated by decree all controls on exploitation of oil, gas and coal. This almost certainly will also lead to the cancelation of U.S. commitment to the Paris Climate Agreement and an end to the curtailment of U.S. carbon emissions, which will jump significantly, encouraging China and India also to ignore the new Paris 2 per cent reduction protocols, although there are signs that China won’t take the bait. His policies could set back the environmental cause a generation and empower the oil and gas multinationals to more brazenly drill for oil in environmentally pristine areas. The best outcome for those concerned about the well-being of people and the planet is that, like the era of the Vietnam War, we may experience a flowering of global resistance against Trump’s anti-environmentalism that works to galvanize and consolidate a variety of groups in a rainbow coalition to strike new values, ‘soft skills’ and forge a global action agenda.

A major problem is the lack of formal accountability structure in global civil society linking agencies to the publics they directly affect, especially in a system where accountability is derived from the consent of states. The international system of nation-states seems somewhat outmoded in dealing with global problems that spill over national boundaries and does not effectively recognize either sub-state actors or differentiated and emerging global publics such as the world’s indigenous peoples. The new protectionism that is the heart of the rise of far-right inspired national populism is a wild contagion against all outsiders, refugees and migrants that militates against the liberal international order that prevailed in the last 70 years.

The structural imbalance in global governance between democracy and the market, especially capital markets, is part of the frustration felt by those scientists who believe that the sustainability paradigm has failed because although the science of climate change has firmed up against organised and well-funded climate deniers, the governance of climate change is painfully slow, cumbersome and open to “buy-off.” Thus, in terms of grassroots democracy, local participation within the nation-state has been compromised by neoliberal reforms that substitute the market for the state, forcing green politics increasingly outside the realm of electoral democracy. This badly compromises the capacity of public schools, which are now under the threat of privatization and ‘charterism,’ to critically engage students on issues of sustainability. One of the effects of globalization has been to advantage global markets, granting movement of capital and goods certain privileges and a head start over incipient global forms of democracy and the development of new international environmental agencies.

This fragile situation – some would say, ‘inherent contradiction’ – has led the likes of Ingolfur Blühdorn and Ian Welsh (2007, p. 185) to talk of the era of post-ecologism and the politics of unsustainability. They made this assessment before the election of a Republican Cabinet that is collectively anti-environmental and pro-oil and gas. Post-ecologism is reminiscent of diagnoses of the ‘end of nature’ (e.g. Carson, 1962; Merchant, 1980; McKibben, 1990) and earlier announcements of ‘post-environmentalism’, the ‘fading of the Greens’ and the ‘death of the environmental movement’ (Young, 1990; Bramwell, 1994; Shellenberger and Nordhaus, 2005). The question in this new political environment is how to name this historical moment and in face of a concerted attack on the environmental movement how to imagine a rallying resistance that harnesses all global forces, including education for sustainability, future green decades, green litigation and rainbow green coalitions.

Blühdorn and Welsh (2007) go on to argue “the compatibility and interdependence of democratic consumer capitalism and ecological sustainability has become hegemonic” and “faith in technological innovation, market instruments
and managerial perfection is asserted as the most appropriate means for achieving sustainability” (p. 186). Is there a form of sustainability education that can chart a course that helps unhinge the easy accommodation between consumerism and sustainability, to encourage a more critical mode of education of market solutions to environmental problems?

Where many prominent environmental scientists see the failure of the sustainability paradigm as a failure of democratic governance at the global level – that is, a failure to act on the basis of strong and increasingly incontrovertible evidence, Blühdorn and Welsh (2007) emphasize the incompatibility of sustainability with the dominant neoliberal economic system and the culture of mass consumption it generates. What is more, they take the argument into the realm of subjectivity when they hypothesize that ‘western practices of individualized, consumption-oriented identity formation’ and ‘the axiom of individual self-responsibility’ cascading through ‘the institutions of market-oriented governance,’ condition citizens to accept an environmental precariousness on the basis of a popular hegemonic set of relations between the fruits of consumer capitalism and ‘feel-good’ sustainability.

Hence, it is no surprise that living unsustainably has become the default (‘normalized’) on the planet: unsustainability is made easy; sustainability is made hard. There are clear trends and manifestations representing global systemic dysfunction, including rising inequality; loss of biodiversity and top soils; changing climates and weather patterns; and the continued toxification of water, air, soil and bodies. Education as usual, much like business as usual, is no longer an option. Education and science have become an extension of the globalizing economic system. We are preparing young people to become hard-working, lifelong learning, flexible workers who want to consume all the time. Education and science are both at risk of being hijacked for instrumental purposes that do not serve the well-being of people and the planet. Education and science are not for profit, to paraphrase Martha Nussbaum (2010). When education and science become tools to prescribe how people should live their lives, both become fundamentally undemocratic and, indeed, unsustainable. And yet in a post-truth world there are important issues that yoke science as empirical truth with democracy that we might christen ecological democracy that provides the warrant and justification for concerted civil action and demonstrates the new power of citizen science groups that can act autonomously in the interest of their local communities.

Counter trends in education and research?

DESD, GAP and GEM – some responses from the UN

UNESCO, the lead agency for the Global Action Programme (GAP) on Education for Sustainable Development (ESD) – the official follow-up to the UN Decade of ESD (DESD) which ran between 2005 and 2014 – is seeking to address the challenges facing the future of ESD in relation to current changes taking place in the world. Although the work done under this umbrella, certainly during the early years of the DESD, can be critiqued for its lack of historical awareness of social movements and other ‘planetary’ educations, for being ‘top down,’ neo-colonial and undemocratic, for a-critically embracing ‘development’ and something to continuously focus on, ESD also triggered and stimulated some important alternative approaches to education. The major question concerns action-based pedagogies to
develop sustainability as a way of life that rests on empowerment, broad-based citizen engagement, the significance of community models and education programs that help students become change agents. Arguably, with time some manifestations of ESD also brought to the fore the importance of addressing systemic dysfunction and generating more systemic responses that address structure, agency, leadership, governance and content of education with full consideration of the context in which it takes place.

The 2016 Global Education Monitor Report ‘Education for people and planet: creating sustainable futures for all’ (UNESCO, 2016), for instance, highlights the so-called ‘whole school approach to sustainability’ which simultaneously seeks to re-orient curriculum, school-community, relationships, professional development, management, pedagogy and a school’s own sustainability performance (in terms of democratic processes, energy use, food served, waste reduction and management and use of school grounds). The GEM2016 report focuses on 2 of the 17 UN-adopted Sustainable Development Goals (SDGs) – SDG 4 (quality education) and SDG 17 (partnerships) as mechanisms or processes that can help realize the 15 others which focus on topics related to the three commonly distinguished pillars of SD (people–planet–prosperity).

Does the GEM2016 report signify a change from the dominant neo-liberal agenda that sees education as an extension and a driver of the globalizing economy and its push for infinite growth, innovation and expansion? If you are looking for confirmation of replication and affirmation of this agenda, you will find it; however, if you look for a shift in the common discourse, you will also find it. Reading the text viewed through a transition lens, a counter-narrative and a potential shift away from business as usual can be detected. Here we list our own selection of quotes, normally not found in UN reports, that seem to support this:

- Current models of economic growth cause environmental destruction.
- For education to be transformative in support of the new sustainable development agenda, ‘education as usual’ will not suffice.
- Education cannot fight inequality on its own. Labour markets and governments must not excessively penalize lower-income individuals. Cross-sectoral cooperation can reduce barriers to gender equality.
- A whole-school approach is needed to build green skills and awareness. Campaigns, companies and community and religious leaders must advocate for sustainability practices.
- Expand education on global citizenship, peace, inclusion and resilience to conflict.
- Emphasize participatory teaching and learning, especially in civic education.
- Invest in qualified teachers for refugees and displaced people, and teach children in their mother language.
- Incorporate education into the peace-building agenda.
- Distribute public resources equitably in urban areas, involving the community in education planning.
- Mobilize domestic resources, stop corporate tax evasion and eliminate fossil fuel subsidies to generate government revenue for fundamental needs such as education and health.
- Include education in all discussions on urban development. Improve and fund urban planning programmes and curricula to include cross-sector engagement and develop locally relevant solutions.
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• Promote the value of indigenous livelihoods, traditional knowledge and community-managed or community-owned land through actions such as land conservation and locally relevant research.
• Engage community elders in curricular development and school governance, produce appropriate learning materials and prepare teachers to teach in mother languages.
• Incentivize universities to produce graduates and researchers who address large-scale systemic challenges through creative thinking and problem solving.
• Promote cooperation across all sectors to reduce policy-related obstacles to full economic participation by women or minority groups, as well as discrimination and prejudice that also act as barriers.
• Support multi-stakeholder governance for the sustainable management of natural resources and of public and semi-public rural, urban and peri-urban spaces.

Additionally the GEM2016 has a somewhat different take on Sustainable Development compared to previous UN reports, recognizing that there are different perspectives, including ones that critique the notion of continuous development (Box 2.1).

Box 2.1 Excerpt from UNESCO’s 2016 Global Education Monitor Report: change of narrative?

“The different perspectives of sustainable development include viewing it as a model to improve current systems (endorsed by those focusing on viable economic growth), a call for major reforms (supported by those who advocate for a green economy and technological innovation) and an imperative for a larger transformation in power structures and embedded values of society (supported by transition movements). Some ecologists, such as deep ecologists, believe present-day human development focuses too much on people and ignores the plant, animal and spiritual parts of this world (Leonard and Barry, 2009). They believe humans must learn to be less self-interested and place the needs of other species alongside their own. Transformation advocates say societies should go back to ways of living that are locally sustainable – consuming and wasting less, limiting needs to locally available resources, treating nature with respect, and abandoning polluting technology that has become an integral part of modern society. Culture advocates believe sustainable living can happen only if communities truly embrace it as part of daily culture (Hawkes, 2001) so that it affects decisions about what to eat, how to commute to work and how to spend leisure time.

The South American buen vivir movement rejects development as materialistic and selfish, implying that living sustainably means finding alternatives to development (Gudynas, 2011). The buen vivir belief system comes directly from traditional values of indigenous people, and posits that collective needs are more important than those of the individual. In Ecuador, this concept is called sumak kawsay, the Quechua term for fullness of life in a community.
It involves learning to live within boundaries, finding ways to reduce use or to do more with less, and exploring non-material values. Ecuador and the Plurinational State of Bolivia have incorporated buen vivir into their constitutions.

Most definitions of sustainable development challenge the status quo, believing human development lacks meaning without a healthy planet. This view requires people, communities and nations to reconsider basic values of daily living and change the way they think. Understanding one’s own values, the values of one’s community and society, and those of others around the world is a central part of educating for a sustainable future. This means education systems need to continuously evolve and change in order to identify what practices work best within a given context and how they need to change over time. Indeed, for many of its advocates in education, sustainable development is best understood as a journey, rather than a destination.’

Source: (UNESCO, 2016, p. 4)

The GEM2016 report seems to advocate the idea of sustainable development as a journey, a collaborative search for and engagement in sustainability, one that is not limited to small elites in society, but rather one that is accessible to all stakeholders, including those who are marginalized. The processes of searching and engaging are as important as their outcomes, as they enable a reflexive and ‘learning’ society that is capable of responding to setbacks, crises, challenges, and systemic dysfunctions that may benefit some in the short term but harm all in the long term. Viewed as such, education and science for sustainable development require space for social learning. Such space includes space for alternative paths of development, but also alternatives to ‘development’ itself; space for new ways of thinking, valuing and doing; space for participation minimally distorted by power relations; space for pluralism, diversity and minority perspectives; space for deep consensus, but also for respectful dissensus (Koppen et al., 2002); space for autonomous, deviant, disruptive and counter hegemonic thinking; and space for self-determination.

UNESCO’S (2017) report Education for Sustainable Development Goals focuses on the capacity of education to pursue the 17 SDGs conceived as universal, transformational and inclusive provided within a unified global framework. The SDGs are pictured as global challenges for the survival of humanity as a whole (and for future generations) that ‘set environmental limits and set critical thresholds for the use of natural resources’ while recognizing the interconnectedness of poverty and economic development. David Griggs and his colleagues (2013, p. 305) recognized that ‘planetary stability must be integrated with United Nations targets to fight poverty and secure human well-being’ and provided a unified framework that linked SDGs with MDGs. Such a unified framework could facilitate connecting what Murray Bookchin (2005, orig. 1982) called ‘social ecology’ with issues of ‘environmental ecology’ and ‘political ecology’, thereby raising the issue of democratic governance that is at the heart of ‘ecological democracy.’

Although still ignoring the non-human and more-than-human, this connection could also represent a step toward an ‘ecological’ appreciation of the
interconnectedness of systems linking questions of subjectivity and epistemology with environmental ecology and political governance (Bateson, 1972). The mind and human subjectivity has been part of the evolution of the planet, albeit rather recent in the 4.6-billion-year history of the Earth. One of the problems, as Guattari (2000) argues, is that ‘Post-industrial capitalism – which Guattari calls Integrated World Capitalism – is delocalized and deterritorialized to such an extent that it is impossible to locate the source of its power’ (Translators’ Introduction, p. 6). Well before the era of post-truth he understands how mental ecology can be the manipulation of mass media–produced subjectivity – a critical issue for education.

Science in transition

The call for boundary crossing, partnerships, joint learning and alternatives for and even to development is not only limited to education in the context of sustainability, but also can be found in science in the context of sustainability. With the bankruptcy of science for impact factors nearing and the loss of public trust in science rising, the call for greater connectivity between science and society is growing louder (e.g. Gibbons et al., 1994; Martens et al., 2010). Echoing the visionary work of Funtowicz and Ravetz (1993), these voices call for the act of science to become a more open and democratic activity that invites public engagement and enables society to reflexively respond to urgent sustainability challenges. Inevitably, higher education (HE) needs to be closely attuned to these changing times.

The European Commission–funded EnRRICH (Enhancing Responsible Research and Innovation through Curricula in Higher Education) network concluded in its final report that higher education is at the crossroads, having to choose between the business-as-usual path of commodification of knowledge and learning focused on the well-being of the economy and the innovative path of socio-ecological transition requiring new responsible forms of collaborative research and learning and alternative capabilities and values that contribute to the well-being of the planet and its people (Tassone & Eppink, 2016). These collaborative forms of research and learning suggest a shift away from ‘research as mining’ grounded in empirical analytical, positivist and mechanistic traditions towards ‘research as co-learning’ rooted in hermeneutic interpretivist traditions and ‘research as activism’ rooted in socially critical transformative and even transgressive traditions (Dillon & Wals, 2006). The latter perspective is one that is quite controversial in science as it invites academic research to become advocates of a particular cause where they essentially are explicitly biased as opposed to neutral or objective (which from this vantage point is an illusion to begin with).

In light of global systemic dysfunction and structural favouritism towards exploitation and inequity, the idea of transgression or disruption of routines and systems that are inherently unsustainable but often highly resilient becomes an option worth pursuing. This pursuit will lead to questions about what methodologies, methods and competencies are needed for operating in a good way within such a transgressive activist framework. As far as methodologies and methods are concerned, a whole set of reflexive, participatory and transformative approaches is available (see e.g., Regeer et al., 2009; van Mierlo et al., 2010).

The EnRRich project referred to earlier created a so-called responsible research and innovation competence framework that acknowledges the complex and wicked nature of sustainability challenges, which is not meant to be prescriptive but rather as a guide or heuristic for higher education (Figure 2.1).
Although we think relational thinking and/or systems thinking is critical as well, we do believe all the competence areas in Figure 2.1 are crucial – as many of the other chapters in this volume seem to confirm – but of particular interest to us is the recognition of participation and collaboration and of ‘disruptive thinking’. The first two link up with our concern for democracy; the latter with our concern for resilient unsustainable structures as it suggests that responsible research and innovation requires people who are capable to break with the ordinary, question the taken for granted and to transgress stubborn routines. In the next two sections we discuss two such possibilities that relate to these capacities: citizen or, rather, civic science as a means of promoting ecological democracy and transgressive education as a means to disrupt, transgress and transform unsustainable practices.

**Ecological democracy**

From its development in the 1980s and 1990s, Green Political Theory (GPT), or ecopolitics, founded on the work of John Dryzek (1987), Robyn Eckersley (1992), Val Plumwood (1993) and Andrew Dobson (1980), participatory democracy has been viewed as a central pillar and key value often associated with descriptions of decentralization, grassroots political decision making and citizen participation, ‘strong democracy’ (Barber, 1997) and increasingly with conceptions of deliberative democracy. The value of participatory or grassroots democracy also seemed to gel with a new ecological awareness, non-violence and the concern for social justice.
Green politics favoured participatory and more recently deliberative democracy because it provided a model for open debate and direct citizen involvement and emphasized grassroots action over electoral politics.

John Dewey (1916), as perhaps the arch defender of participatory democracy, proposed an ‘ecological’ system over 100 years ago that was based on a form of Darwinian naturalism that understood that knowledge arises from the experience of the human organism in the process of adapting to its environment. For Dewey, democracy is not just a means of protecting our interests or expressing our individuality, but also a forum for determining our interests. It was above all an account of democracy as social inquiry that emphasized the importance of discussion and debate as a mechanism of decision making with the institution of education at its heart. Democracy is a form of ‘organized intelligence’, and ‘education is a regulation of the process of coming to share in the social consciousness’ as he says in *My Pedagogical Creed* (Dewey, 1897, p. 15), as the only sure means of social reconstruction and reform. Dewey is the foremost philosopher of education in the twentieth century and perhaps also the most concerned for developing an account of education and democracy – of education as essential democratic institution in building civil society and citizenship. As such it might be argued that Dewey proposed the ideal ‘ecological’ model of grassroots participation that cultivates green citizenship.

What is worthy of consideration is the ready acceptance by Dewey of the argument of social ecology when it comes to a democracy of ‘organized intelligence’ (what we might call ‘collective intelligence’ today). There are also good grounds for interpreting Dewey’s naturalistic theory of experience as a fundamental ecological perspective, and that takes us in the direction of the definition of ecological democracy as sustainability in action – not merely a set of biological processes but simultaneously an orientation of grassroots social and political forces shaping the ecosphere.

The paradox is that although the global spread of democracy in the post-war era has been remarkable, there has been considerable “backsliding” and the creation of a “democratic deficit” in the long-established democracies as neoliberalism has come to prevail, leading to public scepticism of electoral politics and loss of faith in parliamentary authority. Economic liberalism has crowded out political liberalism and reduces democracy to market principles: policies as products, voters as passive consumers, politician as producers and elections as markets.

As Justin Turner (2015, p. 8) argues ‘Being Young in the Age of Globalization’ is increasingly precarious in a world where ‘over one billion children [are] living in poverty, 400 million lacking clean drinking water, and 165 million under the age of five experiencing stunted growth because of malnutrition.’ Neoliberalism as an economic project relies increasingly on privatization of not just land, water, air, minerals and seeds, but also of education (e.g. through “school choice,” vouchers and charter schools) as a political project tends to involve the deliberate shrinking of the government’s role in the development and protection of civil society:

The state experiences a redefinition of its responsibilities, shifting away from the interventionist and welfarist models toward a system more conducive to the accumulation of capital on a global scale . . . and more reliant on privatization. As a pedagogical model, this historical project reshapes the social, not simply by influencing economic policies or modes of governance but by manufacturing a specific neoliberal subject.
Turner’s conclusion, in our arguably ‘elitist’ words, is that ‘neoliberalism submits youth to the logic of hyper-individualism and disengages them from community and society in general’ that in turn makes them less prepared and less able to cope collectively with the consequences. So youth are the most critically affected ‘by this exclusionary form of governance’ and ultimately their privatized and individual schooling experience disbars them from natural participation or engagement in civil society or even of developing faith in collective decision making or direct forms of political action.

Foucault’s now-classic concept of governmentality applied to neoliberalism subjectivity conditions the new generation as ‘rational utility maximisers’ in all of their behaviour, leading to the decline of social democracy and the erosion of the participatory ethos underlying “thick” conceptions of green citizenship (Peters & Marshall, 1996; Peters, 2011).

Against the climate-change deniers, the scientific consensus is now almost complete and the evidence seems unassailable, yet political action is slow and open to policy reversals such as that intimated by Donald Trump. Achieving reductions in target emissions is notoriously difficult to police. Democracy is painfully slow and open to manipulation: the question must be asked whether it is up to the task in the new global environment where action is through agreement of interest-based states. Does it provide the appropriate decision-making mechanism and vehicle for political action at either the level of the nation state or at the extra-state level?

Nico Stehr (2016) asks under exceptional circumstances ‘Does Climate Change Trump Democracy?’ He refers to a number of climate change scientists and political commentators who have lost faith in the ability of the democratic process, such as James Hansen who sounded the alarm on global warming in 1988 before Congress and James Lovelock (2009), who in his book The Vanishing Face warns that we need to go on an emergency war footing with temporary suspension of democracy in order to cope with the challenges of climate change. It also turns to Dale Jamieson, a professor of environmental law at New York University and author of Reason in a Dark Time: Why the Struggle Against Climate Change Failed – and What It Means for Our Future (2014), who warns that climate change presents us ‘with the largest collective action problem that humanity has ever faced, [but] evolution did not design us to deal with such problems, and we have not designed political institutions that are conducive to solving them,’ adding ‘Sadly, it is not entirely clear that democracy is up to the challenge of climate change’ (cited in Stehr, 2016, pp. 38–39).

The ‘anti-democracy’ claims of some scientists who suggest that democracy is too slow, too open to corruption and too irrational seems to be supported by a general public scepticism and disenchantment with democracy, not to mention historic referenda that have rendered deep national divisions and been open to ideological manipulation based on fear tactics. The 2015 report of the Fourth World Conference of Speakers of Parliament speaks of the emergence of ‘a toxic combination of adversarial politics, broken promises and a perceived inability to bring about positive change [undermining] public confidence in political processes.’ The report also flags the demise of democracy on two fronts: an institutional failure to perform properly and a diminishing sphere of influence under global financial capitalism.

At the heart of public scepticism, perhaps, is a judgment about parliament’s capacity to perform its functions effectively and to embody key democratic values.
The environment in which parliaments operate is changing, and in some ways very fast. **Much decision-making power no longer resides at the national level**, where parliaments can exert the most influence. Global financial markets increasingly shape our national policies, and international agreements can constrain a State’s ability to regulate the economy independently. More decisions are taken within intergovernmental forums where parliaments typically have little influence – for example regarding the rules of international trade – and national politics are seen as powerless to influence developments. *(www.ipu.org/splz-e/speakers15/rpt3.pdf, p. 2. Bold in original)*

The report concludes by suggesting a series of recommended actions to strengthen democratic culture and revitalize representative democracy, including ‘investing more in civic and political education for children in schools’ and ‘making concerted efforts to encourage people, especially young people, to vote’ *(Stehr, 2016, p. 5).* Perhaps of all the measures recommended, the last is the most important: ‘democratizing the system of international relations, enhancing the role of parliaments vis-à-vis the issues that are high on the global agenda, and further developing the parliamentary dimension of the work of the United Nations *(Stehr, 2016, p. 5)*’.

Stehr does not disagree with climate or political scientists about the challenges we face as a global society from climate change, nor, indeed, with the empirical evidence that indicates stable or increasing rates of deterioration, but he does draw the line when it comes to the inference that exceptional circumstances dictate that we turn away from democratic processes as a ‘convenient’ way to govern.

I will insist that there is no contradiction between democratic governance and scientific knowledge. Rather than lamenting the inconvenience of democratic governance, the need is to enhance democracy, not despite, but especially in light of, the massive challenges of a changing climate. We need to recognize our changing climate as an issue of political governance and not as an environmental or economic issue. *(Stehr, 2016, p. 39)*

Rarely do the results of scientific inquiry provide such an unequivocal and overwhelming set of findings as climate science does in this case. One might argue that this provides an ideal Piercean community that has gathered confidence and also to all intents and purposes, achieved consensus on the interpretation of hard evidence as time has progressed. Stehr argues there is ‘no contradiction between democratic governance and scientific knowledge’, but the political arguments of climate scientists point to the need for stream-lined emergency decision making in our collective global interests and they, also rightly in my mind, point to the encumbered nature of democratic governance at the global level. They are worried that time is running out and that the politics of climate change in the past 25 years reveals an inability to act decisively on the evidence indicating the structural incapacity of global governance working for consents of some 200 world states to achieve consensus or majority status in order to act both collectively and decisively. It is unimaginable that sovereign states would ever give up their power of consent, but it is certainly within the bounds of our technological and democratic capacities to develop continuous online voting, consensus building and rapid decision making.7

Tim Forsyth (2014), in an article ‘Deliberative Democracy and Climate Change’, reviews five significant contributions from leading scholars and emphasizes how
the traditional international relations approach has been recently supplemented by approaches from other disciplines that focus more upon how different sub-state social actors such as citizens and businesses contest climate change politics, and how their actions are governed by underlying discourses, rather than on the analysis of national interests alone. A key theme of this analysis is deliberative democracy – or the achievement of political actions through open debate, and the consideration of differences between actors.

(p. 1115)

These approaches that favour deliberative democracy explore ‘how consensus might be achieved among different actors’ who operate on the basis of different understandings and how developing countries can become involved in discussions. This is a process that depends upon clear communication of the findings of climate science to different public arenas and allows multiple levels of engagement (Dryzek et al., 2013). Other approaches tend to emphasize the normative and political dimensions of climate change and include it within the realm of deliberative rather than something given once and for all. Forsyth (2014) writes:

Dryzek and Stevenson (2014) define deliberation as ‘communication that is non-coercive, capable of connecting expression of particular interests or positions to more general principles, induces rejection on the part of those both speaking and hearing, in which participants strive to make sense to those who do not share their own conceptual framework’.

(p. 12)

The authors usefully identify different spheres of deliberative systems, including the private sphere, public spaces, empowered space, transmission of influence, accountability, meta-deliberation and decisiveness. Deliberative democracy involves the articulation of reasoned argument in public spaces that is non-coercive, open and transparent as well as progressively transformative, that is, moving toward some accepted and effective resolution. What is important about this approach is that it enables us to focus on ‘deeper origins of disagreements other than interests’ and ‘presents a framework for resolving differences through processes of discussion and engagement’ (p. 1123).

The model of deliberative democracy philosophically springs from its pragmatist roots that suggest, over and above the mechanics of voting and representative democracy, that democracy needs to take a deliberative or participatory form as a social way of life that supports, builds and protects civil society (Florida, 2013). In Deliberative Democracy and Beyond John Dryzek offers this perspective:

Deliberation as a social process is distinguished from other kinds of communication in that deliberators are amenable to changing their judgements, preferences, and views during the course of their interactions, which involve persuasion rather than coercion, manipulation or deception. The essence of democracy itself is now widely taken to be deliberation, as opposed to voting, interest aggregation, constitutional rights, or even self-government.

(p. 1)
Some scholars embrace deliberative democracy for its educative power and its pedagogical force in teaching students to reason about ecological issues and to accept responsibility for their daily practices and actions. The deliberative nature of ecological democracy has strong roots in grassroots participation in civil society. In philosophical terms it is indebted to John Dewey’s (1916) *Education and Democracy* and more recently to the German philosopher Jürgen Habermas’ (1984) theory of communicative rationality based on the ideal of a self-organizing community of free and equal citizens, coordinating their collective affairs through their common reason. Free and open debate in society and the classroom is a necessary condition for the legitimacy of democratic political decisions based on the exercise of public reason rather than simply the aggregation of citizen preferences as with representative or direct democracy.

Mauve Cooke (2000) puts forward five arguments for deliberative democracy, emphasizing (1) the educative power of the process of public deliberation; (2) the community-generating power of public deliberation; (3) the fairness of the procedure of public education; (4) the epistemic quality of the outcomes of public education; and (5) the congruence of the ideal of politics articulated by deliberative democracy with our democratic subjectivities and values. Although criticisms can be made in terms of conceptions of radical democracy and insensitivities to minorities, the concept of an ecological deliberative democratic model offers substantial pedagogical benefits, especially when combined with school-based citizen science.

**Entering citizen science, civic science**

Muki Haklay (2015) provides a comprehensive report on how citizen science can significantly contribute to policy formation especially in environmental monitoring and decision making. He makes the case this way:

> The past decade has witnessed a sustained growth in the scope and scale of participation of people from outside established research organizations, in all aspects of scientific research. This includes forming research questions, recording observations, analyzing data, and using the resulting knowledge. This phenomenon has come to be known as citizen science. While the origins of popular involvement in the scientific enterprise can be traced to the early days of modern science, the scale and scope of the current wave of engagement shifts citizen science from the outer margins of scientific activities to the centre – and thus calls for attention from policymakers.  
> (Haklay, 2015, p. 4)

An emerging challenge of citizen science is its deployment in education at all levels to promote participatory scientific practices integrating school, STEM education and environmental science and green studies at university to promote do-it-yourself (DIY) science for local communities that encourages committed and objective, disinterested research based on rigorous and systematic data collection, on the one hand, and, on the other, environmental responsibility for an action agenda – an indissoluble link carrying an ethical and political obligation to act on results. Indeed, we might better characterize the action imperative as a result of the shift from the industrial science model to an ecological systems view that recognizes the interconnectivity of all things and problematizes the disinterested scientist and spectator theories of knowledge.
The European Commissions’ *Green Paper on Citizen Science* entitled ‘Citizen Science for Europe: Towards a better society of empowered citizens and enhanced research’ (2014) puts the argument powerfully in terms that readily carry educational and pedagogical possibilities:

ICT facilitates a shift of paradigm, with a more open research process sharing good and bad experiences through digital media and collaboration efforts. These new participative and networked relationships promote the transformation of the scientific system, allowing collective intelligence and new collaborative knowledge creation, democratizing research and leading into emergence of new disciplines and connections to study emerging research questions and topics. While doing this, participatory approaches contribute to long-term inclusive education, digital competences, technology skills and wider sense of initiative and ownership.

(Haklay, 2015, p. 14)

We are at the beginning of a new era characterized by the cooperation of amateur and professional scientists where enhanced computing and computation power along with big and linked data signal an exciting mix of local and global, humans and machines, humans and nature in the transgressive pedagogical paradigm that moves beyond the industrial scientific model of applied science.

In the introduction to a special issue on citizen science in *Conservation Biology* Dillon et al. (2016) introduce a particular strand of citizen science that fits well with the idea of ecological democracy. They speak of ‘transition-oriented civic science’ to emphasize that not the questions and concerns of scientist are the point of departure of collaborative inquiry, but rather those of concerned citizens. In other words, it is not so much about citizens supporting science but rather about science supporting citizens. The ‘transition-oriented’ suggests a normative stance towards a shift away from unsustainable routines and systems that tend to lead to the earlier global systemic dysfunction (e.g. planned obsolescence, built-in inequality, fossil fuel dependency, loss of identity and sense of place, etc.). This relatively new approach can be traced back to a post-normal science perspective (see for instance Ravetz, 2004), which assumes that citizens have or need to have agency, there are multiples ways of knowing and different types of knowledge that all are relevant (e.g. indigenous knowledge and local knowledge) and that improving a ‘wicked’ sustainability challenge requires social learning between the multiple stakeholders/actors affected by an issue (scientists being one of many). In their conclusion Dillon et al. write:

[O]ur civic-science version of citizen science calls for expanding public participation beyond the volunteers who normally populate citizen science projects, shifting the role of scientists to one of the stakeholders (but with recognized important technical expertise), and engaging all stakeholders as co-creators and co-learners in a deliberate and systematic process of knowledge building.

An important part of this process is treating emerging goals and knowledge as tentative and subject to revision based on ongoing critical and collaborative dialogue, inquiry, and action.

(Dillon et al., 2016, p. 454)
The transformative power of conflict: transgressive education and research

As it is difficult not to, let us return to Trump again, albeit briefly. The people who voted for him are not a homogenous bunch, but turn out to be quite diverse. They include people who actually detest everything he represents but at the same time are deeply troubled by hegemonic structures of power and exploitation that are highly resilient (e.g. capitalism). These people, at least some of them, feel that the only way this resilience is broken is by creating a disruptive event that will create chaos and a new dynamic that might germinate a new society based on alternative principles, values and structures that they feel are more desirable. Any moderate consensus-seeking alternative will only strengthen the status quo. ‘If not Bernie, then Trump to bring about real change,’ so to speak. The election of Trump can be viewed as a disruptive event in that it does upset conventional rules and norms and creates energy, disorder and confusion out of which something new might arise. Of course, the normative direction of the transition this disruptive event might take adds to the uncertainty: it could lead to transition towards fascism, for instance, or towards sustainability when counter-movements and grassroots sustainability niches might coalesce. We don’t know at this point. What is of interest here is the potential power of disruption in bringing about fundamental change.

In sustainability discourse lots of emphasis is placed on the power of adaptation in responding to the manifestations of systemic global dysfunction such as climate change. The message is, simply put, that the world is changing, and we must learn to adapt and to become resilient to survive as a species. Ironically a focus on adaptation distracts from a critical exploration of the root causes of this systemic global dysfunction. Such exploration would reveal some serious flaws in the assumptions underlying modernity that in the end make unsustainability easy and almost our second nature and sustainability hard and almost counter-intuitive. Such exploration would also reveal that these assumptions and the structures, systems and lifestyles that result from them are very resilient themselves: changing them is hard, if not near impossible. From a sustainability point of view, disruptive capacity building and transgressive acts of transformation seem critical but are given little attention in education and research. This leads to questions like: What might disruptive capacity building entail? How can it be developed? What does transgressive learning look like? What is the role of schools and universities in supporting it?

Here we wish to connect to the ISSC-funded T-learning transformative knowledge network mentioned in the opening paragraph of this chapter. In this network learning has been identified as an important driver of change towards sustainability. Yet little is known about the type of transformative, transgressive learning (t-learning) that could potentially enable such change. The T-learning transformative knowledge network focuses specifically on transgressive social learning for social-ecological sustainability in times of climate change. The network seeks to uncover and enable t-learning processes at the climate—energy—food—water security and social justice nexus and aspires to generate, surface and describe qualities of such learning processes and their role and contribution to sustainability transformations. Specifically its objectives are to:

1. Investigate and expand the emergence and qualities of t-learning processes in selected food—water—energy—climate—social justice nexus contexts in diverse niche level settings,
Investigate and identify potential ‘germ cell’ sustainability activities and engage these in potential expansions within a multi-levelled perspective, and trace how this is done, and

Develop generative t-learning methodologies for informing social-ecological science research and praxis, and extend current theoretical work on t-learning within the social-ecological sciences.

(www.transgressivelearning.org)

Central in the T-learning network is the transformative potential of disruption and transgression in reframing dominant narratives in education and learning spaces (Lotz et al., 2015). The network seeks to strengthen commitment to the commons and the common good, to decolonisation, the good life, ecological economics, real sustainability and will seek to bring environmental and social justice into being.

Let us look at disruption and transgression a bit more closely. In a sense, a disruption represents a discontinuity of the ordinary of the usual of the expected. It forces people to leave one’s comfort zone: a state of disequilibrium. Such discomfort can be generative when it invites people to explore other options, to build new alliances or to re-think what they always thought to be normal or true, for instance, but can also be regressive when it numbs them, makes them more susceptible to blindly follow others or leads to withdrawal. In other words the dissonance that arises out of acts of boundary crossing (leaving one’s ordinary world) and being exposed to alternative ways of seeing and being in the world can both drive and block learning, co-creation and innovation. Dissonance and disruption entail conflict that might be destructive or constructive depending on when, where, how and with what intend. The crux is how conflict is dealt with. Too much conflict may lead to a break in interaction when people are too far out of their ‘comfort zone’ (and some people have bigger comfort zones than others with respect to being challenged), whereas too little of it is just as likely to prevent any significant learning.

In transgressive learning people are learning on the edge of their comfort zones with regard to dissonance. When facilitators of interactive processes manage to strike a balance between comfort and tension, creating ‘optimal dissonance’ by skilfully stretching comfort zones as needed (Schwarzin & Wals, 2012, p. 27), transformative disruptions can occur that push participants away from the ‘comforting bubbles’ of their own (potentially privileged) position and perspective and challenge them to view the world from the vantage point of (perhaps marginalised) others (van Gorder, 2008). When dissonance is addressed as ‘oppositional discourse’, in which participants embrace tensions between different positions and seek to uncover and probe paradoxes and contradictions, it can play a critical role in realizing transitions towards sustainability. The is not new: constructive approaches to conflict have long been shown to play a key role in individual learning (Berlyne, 1965; Festinger, 1957; Piaget, 1964) but from the perspective of transitions and social movements, they need to be studied and understood at the collective level as well. When dissonance is introduced carefully and dealt with in a proactive and reflective manner, it can help participants reconsider their views and invite them to co-create new ways of looking at a particular issue and generate new thinking that can thaw frozen mindsets and break deeply entrenched systems and routines.

Akkerman and Bakker’s (2011) theory on learning across boundaries adds a new dimension to existing learning theories. Whereas conventional learning theories, such as social constructivism, focus on a person’s development of knowledge or capabilities within a specific domain and in a specific context, a
boundary perspective adds the dimension of two-sided actions and interactions between learners anchored in different contexts. Whereas in conventional theories of learning, diversity is often perceived as problematic, in trans-boundary learning this diversity is appreciated. Boundaries can be defined as ‘socio-cultural differences leading to discontinuity in action or interaction’ (Cremers et al., 2016). Boundaries simultaneously suggest a sameness and continuity in the sense that within discontinuity, two or more sites are relevant to one another in a particular way (Akkerman & Bakker, 2011, p. 133). In the context of sustainability the notion of socio-cultural differences probably needs to be expanded to include socio-ecological differences. Such differences refer not just to differences relating to physical and virtual locations or practices, but also to more abstract distinctions, such as different perspectives or perceptions of unfamiliar domains (Engeström, 1999). Cremers et al. (2016), referring to Kerosuo (2004), point out that these differences can be explicitly perceived by diverse actors or they can be more implicit, but still empirically detectable by verbal markers. These markers, they suggest, can be references to synonyms of the word boundary (e.g. border, limit), metaphors (e.g. fences, walls), references to social relationships such as ‘we versus them’, or spatial references to different locations.

So where does this lead us when re-thinking education and research in light of transitions towards a more equitable and enjoyable world where people can live well together while respecting ecological boundaries and the non-human and more-than-human world? Earlier we referred to research as co-learning and research as activism as generative perspectives for transition-oriented forms of inquiry and change. Here we will expand this by introducing three types of work that seem necessary (Peters & Wals, 2013, p. 93).

The work of determining what is. This includes naming, framing and setting problems; identifying, observing and documenting physical, social, cultural, and political realities, phenomena and behaviours; identifying and documenting views, opinions and needs; and identifying and articulating ideals, values and interests. The work of determining what should be and what can and should be done to close the gap between what is and what should be. This includes public deliberation and debate; the production of public judgment; the running of experiments; and the development and testing of action plans, strategies and tools. The work of determining, assessing and interpreting what happened and why and what to do next. This is done both during and after taking action and running experiments, and it can include both quantitative forms of measurement and qualitative and narrative forms of evaluation and interpretive meaning-making.

Considering the importance of transgression and disruption, we propose to add some activities to the work around determining what should be and what can and should be done to close the gap between what is and what should be: determining what works with the changes that are desired change (enabling forces and conditions) and determining what works against these changes (forces and conditions that work to keep things the way they are). Adding this also implies that the work of determining, assessing and interpreting what happened and why would need to include work of determining, assessing and interpreting what did not happen and why. These additions to what Peters and Wals (2010) call phronesis invite critique of hegemony and expose systemic dysfunction and might lead to transgressive acts that open the door for deep transformation. Box 2.2 contains an excerpt from their 2013 chapter that seems quite relevant in the so-called post-truth era.
Box 2.2 Practical theory building as activism

How should educators working in New York State, above the Marcellus Shale (note: a geological formation that contains natural gas that can be extracted for commercial purposes), handle a controversial issue such as this in public classrooms and/or community settings? What position do they take? How do they bring in and treat scientific evidence coming from different sides? Do they take a stance? Do they actively engage in such a complex and existentially relevant issue? Are they able and willing to draw distinctions between rhetoric and reality, and to reduce, using Sandra Harding’s language, the systemic bodies of ignorance created around highly politicized issues such as these? Or should they stay away from issues such as these altogether, and stick to school board – approved textbooks in order to keep controversy out of the classroom? We believe taking one side in the continuum between passive detachment and avoidance on the one hand (“playing it safe”) and active involvement and engagement on the other (“taking a risk”) will not be generative in taking education, learning, and research to a level where we can deal with issues such as these in a more satisfying, less polarizing way.

This is where practical theory building offers a third way forward, as it assumes that learners – including teachers, researchers, policy makers, etc. – do not accept facts as an external given; rather, it requires self-confrontation and joint fact finding as a starting point for learning.

Source: (Peters & Wals, 2010, p. 97)

Conclusion

In light of the earlier proposed need for boundary crossing, learning on the edge of one’s comfort zones and the importance of discontinuities and plurality of ideas, it is also critical that education and research explore the phenomenon of blinding insights and lock-ins. It is well known that the way we frame experiences is closely connected to our cultural narratives and associated encultured and embodied ontological pre-dispositions. This framing gives us comfort, on the one hand, but can blind us to alternative ways of seeing and being that, from a sustainability point of view, might be more generative. Transformative processes are more likely to occur when those involved are or become aware of the frames or filters through which they perceive their reality and are able to deconstruct and reconstruct them in their joint pursuit of sustainability. This is no easy task, as people can become so stuck in their own often taken-for-granted and normalized ways of thinking and acting that they fail to see how this colours their judgment and narrows possibilities. The success of transformative learning lies in people’s ability to transgress their way of seeing and being in the world. Such transgression is facilitated by the exposure to alternative ways of seeing and being in the
world and participation in what Chaves et al. (2017) call ontological encounters. They write:

When deployed in the ‘transgressive’ context of our own sustainability struggles, ontological encounters provide a treasure for learning that unsustainable realities are not destiny.

(Chaves et al., 2017, p. 21)

Through these encounters people can become aware of their own frames, filters, values and assumptions, but also of their ideological underpinnings and the resulting tunnel vision that may blind them in pursuit of a more sustainable way of being. When this process takes place in a collaborative setting, where dissonance is properly managed, cultivated and utilized, allowing participants to be exposed to the deconstructed frames of others, old ideas can be challenged and new ones can be co-created (Wals, 2007). We can add to this the importance of creating an atmosphere that invites trust and empathy where people can be comfortably vulnerable, open up their minds and listen to others. Presently the culture in most schools and universities does not allow for such an atmosphere to emerge. Alternative leadership, management and forms of resistance to previously mentioned patterns of individualism, competition and accountability will be necessary. Education based on action pedagogies can play a significant role in joining up a deliberative ecological democracy with new forms of activist science and the rapidly growing forms of citizen science that encourage the use of empirical evidence and logic in a ‘post-truth’ world driving community-based science projects and encouraging linked-up international scientific agendas that promote collection of data and careful evaluation based on systematic observation and experiment.

A final word on transgressive education and research, returning to ‘flowers of resistance,’ is to be based on a philosophical understanding of ‘dissident thought’ – in its civil and environmental forms – that against the structures of power and repression engender sparks of dissidence that leads to a person, movement, literature, or a form of scholarship that actively challenges an established doctrine, policy, or institution to call out against unlawful violations of “human rights”.

Dissident thought has a kinship relationship with the ecology of concepts that proceed from the concepts of dissent and the very possibility of disagreement as an inherent aspect of discourse. It has taken many different forms in relation to discourse, thought and action, and encompassed and cultivated political norms associated with freedom of speech that allows the expression of opposition, protest, revolt and the expression of anti-establishment thought that takes the form of civil disobedience, non-violent protest and sometimes revolutionary activity.

(Peters, 2016, p. 20)

‘The flowers of resistance’ in the age of post-truth – let a thousand flowers bloom!

Questions for comprehension and reflection

1. Is there a form of sustainability education that can chart a course that helps unhinge the easy accommodation between consumerism and sustainability, to
encourage a more critical mode of education that can also lead to question market solutions to environmental problems?

2 What is meant in this chapter by a ‘transgressive research-as-activism framework’? What methodologies, methods and competencies are needed for engaging meaningfully in such a transgressive research-as-activism framework?

3 What action-based pedagogies are available or can be envisioned that allow us to develop sustainability as a way of life that rests on empowerment? How can we educate for broad-based citizen engagement? What is the significance of community models and education programs that help students become change agents?

4 Democracy is painfully slow and open to manipulation. The question must be asked: Is it up to the task in the new global environment where action is through agreement of interest-based states? Does it provide the appropriate decision-making mechanism and vehicle for political action at either the nation-state or extra-state level?

Notes

1 In 2015 the International Social Sciences Council (ISSC) established a research programme on Transformations to Sustainability. This programme seeks to strengthen social responses to climate change and environmental concerns. It has established three Transformative Knowledge Networks linking scientists, educators, civil society, policy makers, business and other stakeholders together. This chapter connects with one of those network: the t-learning transformative knowledge network (see: www.transformativelearning.org).

2 Tillerson developed close ties with Russia, overseeing the Exxon drilling project in 1996 and signing a production sharing agreement that became commercial in 2001 He brokered an agreement to drill for oil in the Russian Arctic Ocean (even though Obama made sure Alaska remains off limits for the time being) with Rosneft, the massive Russian State oil company headed by Igor Sechin.

3 For critiques of ESD see: Huckle and Wals, 2015; Jickling and Wals, 2012; Helberg and Knutsson, 2016; Berryman and Sauve, 2015; Kopina, 2016; Jickling and Sterling, 2017

4 We should declare that one of us, Arjen, acted as an external consultant to the GEM2016 report.

5 These are the exact policies that characterize U.S. Secretary of Education Betsy DeVos’ program of reform under the Trump regime.

6 See www.ipu.org/splz-e/speakers15.htm and www.ipu.org/pdf/publications/speakers15-e.pdf Reference in this paper is to the report “Challenges Facing Parliaments Today”.

7 See, for instance, the UK Labour manifesto on digital democracy under Jeremy Corbyn that looks to a universal service network, open knowledge library, community media platform, platform cooperatives, digital citizen passport, a people’s charter of digital liberty rights and, most significantly, massive multi-person online deliberation – www.jeremyforlabour.com/digital_democracy_manifesto.

References


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