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rewilding technology

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This paper is rooted in the ecological crisis of our contemporary world. Rather than rejecting educational technology (edtech) as too environmentally damaging to use, it draws on critical utopian approaches, feminist science fiction and conservation projects to suggest 'rewilding' as a frame for designing and using edtech with a view to ameliorating technology's long-term inequitable planetary impact. After briefly describing projects for rewilding nature, the paper turns to the specifics of rewilding edtech. It first highlights pragmatic suggestions for more sustainable edtech practices. It then suggests that the concept of 'sustainability' limits current practices, and proposes that a more radical and utopian rewilding can herald an education beyond sustainability. Rewilding edtech prioritises decelerating and degrowth, regenerating and relating, hospicing dying worlds and birthing new possibilities.

Keywords: climate crisis, design, digital media, educational technology, sustainable development

> "It's pretty here," Dex said. "I wouldn't have imagined I'd say that about a place like this, but–"
> "Yes, it is," Mosscap said, as if making a decision within itself. "It is. Dying things often are."
> Dex raised an eyebrow. "That's a bit macabre."
> "Do you think so?" said Mosscap with surprise. "Hmm. I disagree." It absently touched a soft fern growing nearby, petting the fronds like fur. "I think there's something beautiful about being lucky enough to witness a thing on its way out."
>
> Becky Chambers, *A Psalm for the Wild-Built*

In the midst of the current ecological crisis, and what many are calling the sixth mass extinction event, it can feel as if we are witnessing the world 'on its way out', as the sentient robot Mosscap puts it, as it stands with Dex, a tea monk, among ruins from the Factory Age. Today, in what is still the Factory Age, it is widely accepted among ecologists that the current level of global industrial and technological expansion is not sustainable in the long-term.

This issue of on_education calls for educational technology (edtech) to be tamed to serve the public good. Given the ecological impact of edtech, alongside the ongoing commercialisation and learnification of education, the automation of teaching and the entanglement of edtech with surveillance capitalism or data colonialism, it can seem that edtech is more of a threat to education

than a solution. While there are good arguments for taming technology, especially when this taming is understood as subversion, resistance and the design of more equitable and just alternatives, in this piece I will suggest that we (also) need a 'rewilding' of technology to serve a public good which is simultaneously a planetary good. To this end, I first outline the ruins which shape the backdrop to this proposal, then describe key features of rewilding projects before turning to the specifics of rewilding edtech. I then highlight practical suggestions for making edtech practices more sustainable, before considering what a more radical—a more utopian—rewilding could mean for education beyond sustainability. Rewilding, in this sense, opens ways of rethinking rather than rejecting edtech.

This ruined lively planet

Media technologies are made from wild geophysical elements: With their mineral, metal and other material components, media have geological temporalities packed into them, and exude a slow ecological violence on today and the future (Parikka, 2015, 2016). Many people reading this article carry, with our smartphones, non-renewable rare earth metals close to our bodies every day. We use, in our computers, billion-year-old pieces of the planet. Zooming out to this geological 'deep time' of the minerals and metals used for wiring, circuits, microprocessors, camera chips, batteries and so on places edtech in the temporal and spatial contexts of wilderness. Most people who purchase new digital devices are (at least vaguely) aware of the hazardous and unjust labour conditions in the mines, manufacturing and recycling facilities associated with their [our] hardware (Crawford, 2021). This awareness places edtech within global human relations.

The desire for hardware in schools and other educational spaces plays, thus, into the general ecological crisis in which we now live. This is more than climate change, it is the depletion of the planet's resources through extraction, exploitation, extinctions, toxic residue and more. Words such as Anthropocene, Capitalocene or Plantationocene aim to capture the massive scale of change induced by the practices of humans in positions of planetary power (Haraway, 2016; Haraway et al., 2016). Dreams of progress, growth and modernisation, alongside the 'hubris of conquerors and corporations' have led to 'haunted landscapes' and a 'tide of ruination' (Gan et al., 2017, p. G1). These dreams of progress continue to haunt industry reports about, and political or practical hopes for, edtech.

As Haraway reminds us, however, concepts such as the Anthropocene can 'become too big too fast', they 'threaten to collect up everything' (Haraway et al., 2016, p. 561). She encourages us to 'uncultivate' this habit and to remember, by telling local stories (of indeterminacy, contingency and multispecies encounters) and by asking 'what if?', that everything could also have turned out differently and 'may yet be otherwise' (Haraway et al., 2016, p. 561; see also Gan et al., 2017, p. G5). To live in the wreckage of today's world, we need 'humour, mixed with concern, anger, curiosity, and the imaginative insertion, every so often, of a "what if"' (Bubandt in Haraway et al. 2016, p. 562). In this sense of a generative critique that seeks the 'what if', Facer (2019b) highlights moments of ingenuity, exploration and (re)invention amid the ruins. These are moments of beauty in which more people turn more 'respect and attention and care' towards Sila, or Gaia, i.e., the indeterminate, changing, unstable, 'lively planet' on which we live (Facer, 2019a; drawing on, inter alia, Todd, 2016; on the Inuktitut term Sila, see Qitsualik, 2013). These are not, I should perhaps note, new versions of forward-marching progress. Instead, they are critical utopian visions for ways of living, learning, teaching, administrating, leading, programming and designing otherwise.

Rewilding

Rewilding nature is one space in which the 'what if' has turned into concrete regenerative projects that assemble what Haraway might call humans and other critters. Before I turn to the rewilding of edtech below, these local stories of rewilding aim to identify aspects that can inspire wilder, muddier edtech futures.

Rewilding is, at its core, about moving from 'damage prevention' to 'restoring a system that can come to look after itself' (Rewilding Europe, 2016, p. 5). Rewilding is slow. It includes success stories, such as when the numbers of beaver, elk or ibex grow again in places where their numbers were dwindling. Wolves are starting to venture out in Europe again. Rewilding often starts from already-wild spaces, such as the old growth forests in Sápmi, Swedish Lapland.

Rewilding is about finding human and more-than-human allies. On a small scale, gardening tips for urban guerrilla gardening or for rewilding private gardens abound online, including letting the weeds stay, and letting the grass grow long. On a larger scale, in projects like the Glen Affric initiative in Scotland, myriad local partners work together. In October 2021, Trees for Life launched this project to rewild 500,000 acres of the Highlands. Trees are key to the initiative in a space once covered by the Caledonian Forest, but trees comingle with all sorts of others, from fungi to red deer, from schoolchildren to mountains and lochs, from landowners to hunting lodges. Since nature recovery is often blocked by economic concerns, rewilding is also about finding economic allies. Key actors, such as the Global Rewilding Alliance, emphasise that biodiversity protection must go hand in hand with poverty alleviation. Rewilding Europe, Enonkishu Conservancy and others point to the entrepreneurial spirit of rewilding at scale and the opportunities it opens for local economies. 'Co-existence' becomes not only a multispecies ontology but also a pragmatic model for nature-based tourism, which aims to increase public acceptance for rewilding. But rewilding has also been critiqued for its connections to neocolonial ideas of population control, for its asocial and ahistorical tendencies. Here, when I refer to rewilding, I imagine an inclusive rewilding (Jørgensen, 2015), a decolonial rewilding, reflexive of power relations; a rewilding as 'future-in-the-making' (Allen, 2016), rather than a nostalgic 're'-turn to earlier ages.

What does this mean for education and technology? Can edtech come to look after itself? What does slow edtech look like? Which allies can be assembled? What are the small-scale and large-scale equivalents if we play with the concept of rewilding in edtech?

Rewilding edtech I: First steps

When technology, education and the current ecological crisis are discussed together, edtech is, as Selwyn (2021) has written recently, more often seen as a solution than part of the problem. 'Green tech' like smart lighting is installed as schools or universities aim to be carbon neutral. Videoconferencing and virtual learning are seen as sustainable alternatives to travel in order to reduce CO2 emissions. Personal AI companions are envisaged as supporting students through the distress caused by future extreme global weather events (Selwyn, 2021, in critique of e.g., Educause, 2020).

These proposals ignore 'the social, political, biological and geological material processes that coproduce "the virtual"'; they overlook the consequences when 'technology and ecosystems are relational and co-constitutive'; they neglect the geophysical temporality of edtech that 'extends

backwards [to the billions of years it took minerals to form] and onwards [to the consequences that will be carried by many generations yet to be born]' (Piattoeva, 2021, n.p.). They also disregard the 'rebound effect', in which, for example, technologically induced energy savings mean that the technology is then more widely used, and energy consumption increases. Given current insights into the environmental and human costs of producing new technology and dealing with e-waste, which has been well-documented, it seems plausible to counter techno-solutionist greening with the conclusion that 'assumptions of abundant, excessive and "always-on" forms of technology use in education look wholly unsustainable', and that we need, instead, an 'edtech within limits' (Selwyn, 2021, p. 7).

So, what is to be done? Dex, the tea monk in the epigraph above, was given a pocket computer when they were 16 that was built to last their lifetime. Mosscap was 'wild-built' from parts of other robots when they broke. Increasing hardware durability, stopping planned obsolescence, instituting the right to repair and establishing shared DIY community spaces such as repair cafes, are amid the practical suggestions for how to reconfigure the practices of using edtech to make them more sustainable. Further suggestions include establishing commons approaches to the shared ownership of devices in schools, buying refurbished devices, using modular systems and renewables for schools, embedding sustainability as an issue across the curriculum and mainstreaming a mindset of digital abstention, adding the planetary dimension of datafication to critical data literacy, or reducing the use of technology to those moments in which it has a clear benefit (e.g., film-making), rather than assuming that if tablets have been purchased, they should be used for every learning task (Macgilchrist, 2019; Piattoeva, 2021; Selwyn, 2021; Warren et al., 2022)

These are urgent issues and essential practices. They alert us to immediate possibilities and first steps to more ecological institutions. If we see the for-profit edtech industry as the domesticated space of education and technology, these practices take us a few steps away from domestication. They remove the worst excesses of overconsumption and aim towards sustainability. Some schools are already implementing these practices. But they are not yet, I would like to suggest, sufficiently 'wild'.

Rewilding edtech II: Beyond sustainability

One challenge facing writers at the intersection of technology and ecological issues is precisely this concept of 'sustainability' which dominates the debate. Sustainability tends to bring 'development' with it, and even when critically reflexive, development continues to imply growth, expansion or economic progress. Even the more cautious verb 'to sustain' means to remain at today's level of technology use, in which we, who purchase new technology, continue to exploit human labour, produce e-waste and consume natural resources for batteries, electricity, data infrastructures. 'Sustainability' in either of these senses (growth or remaining stable) no longer seems sustainable. Yet when the stories we tell about ecology and edtech continue to use sustainability as a key word, then we are (albeit perhaps inadvertently) narrowing the frame for thinking and action.

What would happen if we did not orient to sustainability, but to rewilding? A specifically justice-oriented form of rewilding edtech—one which is also beyond pragmatic considerations for many people in today's world—might contain the following practices.

First, decelerating and degrowing: Rewilding points to an awareness that, especially for the Global North (which includes the North in the South) from which I am writing, to remain within our

planetary boundaries, we need to acknowledge our complicity, slow down our consumption and stop growing profitability and GDP. This takes the lure out of enthusiastic announcements of the growth of the edtech market. Perspectives on designing technologies for a degrowth society can be adapted for edtech, for instance, 'frugal innovations' which aim to solve local problems (Pansera & Sarkar, 2016), the 'matrix for convivial technology' which emphasises the interdependence and co-constitution of individuals, social networks and technologies (Vetter, 2018, 2021), 'design justice' which aims to recentre people who tend to be marginalized by design practices (Costanza-Chock, 2020), the operationalisation of the 8 R's for educational practice: reconceptualising, reevaluating, restructuring, redistributing, relocalising, reducing, reusing, and recycling (Nierling, 2014) or further ideas from life cycle design, urban mining or the circular economy. Using, for example, local DIY or open source frugal innovations in formal education can feel wild: Things don't work, educators stumble, someone helps, clicks can be slow, data flows clog up, someone turns to their neighbour to talk while waiting, sociality reconfigures itself alongside technology. Deceleration is the opposite of efficiency, it hints at the 'beautiful risk of education' (Biesta, 2013). In this postdigital wilderness, students have the chance to look around and see unexpected moments of beauty. If the context allows.

Second, hospicing and birthing: Drawing on the *Gesturing Towards Decolonial Futures* (GTDF) collective, a key practice that gestures towards ecologically just futures is:

> 'about hospicing worlds that are dying within and around us with care and integrity, as well as attention to the lessons these deaths offer, while also assisting with the birth of new, potentially wiser possibilities, without suffocating them with projections' (https://decolonialfutures.net)

Key here is the adoption of a fragile and humble perspective, which attends to new growth among the toxic wreckage of the world. This perspective invites generous and compassionate encounters with, for instance, educators who are reticent in taking up new technologies. Rather than criticising them for their lethargy or digital incompetence, as the press often does, these educators could be valued as those who are hospicing old technologies (textbooks, overhead projectors, penpal letters) with care, and who are alert to the dignity of the dying and the birth of 'wiser' possibilities. Like the slow process of rewilding, these wiser, decolonial, justice-oriented, wilder possibilities take time to emerge, possibly more time that current pandemic policies and pedagogies demand (Williamson, Eynon & Potter, 2020; on, e.g., decolonial AI, see Zembylas, 2021). The image of assisting in births could encourage educational leaders to invite students to create wild, unruly, implausible visions for developing and using edtech (see Baros et al., 2021; see also Grünberger, 2021). Turned into practice, these wild visions may be the equivalent of the first mushrooms that grew on the site of the Chernobyl nuclear explosion when little else could survive.

Third, regenerating and relating: Rewilding is less about returning to an imagined past, and more about regeneration, renewal, resurgence, recuperation, refusal, reciprocity, respect, relations and intra-relations; about the entanglement of humans and others; about reflecting on the kinds of relations we want to shape. It is within these relations that we can ask how to 'retain the productive horror of our civilization–and yet refuse its inevitability' (Gans et al, 2017, p. G4). If edtech is only used when it has a clear added benefit (see above), one set of wild edtech practices might invite students to co-create speculative fabulations, science fictions and radically just designs. Inspired by

feminist or Black SF, Indigenous scholarship or queer theory, these might be critical utopias that rethink relations as lumpy, respectful, recuperative and resilient, rather than smooth, all-encompassing Metaverses or Squid Game dystopias (e.g., Muñoz, 2019; Smith, 2012; see the stories here: https://feministfutures.net). A long-term hardware rewilding would experiment with alternative technologies like mud batteries or mycelium-grown materials in educational spaces (always mindful of potential rebound effects).

Concluding thoughts

To accept the urgency of change today can also mean agreeing with Dex that it is pretty among the ruins, and with Mosscap that 'there's something beautiful about being lucky enough to witness a thing on its way out'. For me, this is about witnessing how AI, computer games or fast network connections make learning and teaching comfortable, engaging and dynamic. Yet I still need to embark on wilder, more uncertain, more utopian attempts to design and act on alternatives. My individual rewilding attempts are tied up in the classic double of major transformations: consent backed up by coercion (Gramsci, 1971). Consent, as the establishment of a new common-sense; backed up by the coercion of legislation, regulation, taxation, etc.

Overall, both the consent and coercion involved in rewilding edtech mean accepting and acting on what Deborah Britzman (1998, p. 117) has called 'difficult knowledge': Rewilding requires a transition that challenges the norms and values governing most of our lives. What I have called Rewilding II is far beyond practical tools for incremental change. For many, it will seem impossible. John Huckle's observation about education for sustainable development (ESD) from over a decade ago is pertinent for the edtech context. For Huckle, ESD

> 'offers key concepts such as interdependence and quality of life, equity and justice, as if these are unproblematic and can readily be translated into the classroom without related considerations of ethics, politics and global political economy' (Huckle, 2008, p. 70).

These key concepts are also not easy to translate into edtech practice. Rewilding is not a simple process. Living within planetary boundaries means massive, tough and very challenging conflicts with personal/local/commercial/political interests: For those with wealth, it is tough to accept responsibility for the current global situation, and hard to buy fewer new digital toys. For political leaders, it is challenging to be the first country to aim to keep the gross domestic product (GDP) stable rather than growing GDP. For a CEO, it is not easy to convince the shareholders that this should be the first multinational corporation to celebrate annual profit rather than an annual growth in profit. For a country generating income from company taxes, it is difficult to legislate against the monetisation of digital data traces. Rewilding means taking up these ideas and turning them into the things we celebrate.

Schools or universities rarely talk explicitly and openly about the difficulty of knowing about the massive scale of challenges facing the planet today. However, as Fridays for Future has shown, many young people are already acting on this difficult knowledge. For Facer, such initiatives and networks like Ecoversities, Ecovillages or the Dark Mountain community stand in a long history of popular educational institutions, as 'an indicator of civilisational change – they spring up like mushrooms overnight in disturbed land and begin to get to grips with composting the remnants of

the old civilisation' (Facer, 2019a, p. 6).

These initiatives, alongside the other proposals discussed in this article, hint at 'concrete utopias', that is, although they are not pragmatic, they illustrate how utopias exist 'in the quotidian' of our everyday (Munoz 2019, p. 9, drawing on Ernst Bloch). They are 'critical utopias' because they are not naively optimistic. Instead, developed with an historical and geopolitical awareness of ongoing (climate) injustice, they disable political pessimism by enacting the hopes of collectives (Munoz, 2019, p. 3, 30). Rewilding edtech brings different temporalities together in concrete utopias through *decelerating and degrowing, hospicing and birthing, regenerating and relating*: The deep time of rare earth minerals, the fleeting time of the ladybird on the window ledge, the classroom time of individual lessons, the generational time of toxic chemicals in the landscape, the indeterminate time of a new decolonial common-sense, the seed time of new growth, the design time of mud batteries, the composting time of civilisational change, and the convivial time of the wild-built. I end by inviting readers to reflect on how their own institutions and edtech practices are situated within these multiple temporalities, and which ideas they might include in future (collective) decision-making processes.

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