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Introduction

In Australia and many other countries around the world, the “Schools Strike 4 Climate Change” protests led by students – in November 2018, and March and September 2019 – foregrounded a key ethical challenge. Young people enunciated, for all generations to hear, their sense of futures in grave jeopardy from human habits, infrastructures and norms we have been living by. Their challenge calls educators to rethink what it means to be human, and to develop new practices and institutions which express different ethical priorities, including a future orientation for the planet. This requires schools to act on different purposes, acknowledging that, as humans, we live *with/as/in* nature.

The United Nations Environment Program (UNEP 2015; 2019) has long noted the problem that, while there have been significant *scientific* advances in relation to understanding environmental crises, there has been little advance in changing *human behaviour* in relation to those challenges. Instead, lack of action or tokenistic action – especially by governments and large corporations – often makes problems and effects worse, particularly for Indigenous, poor and otherwise vulnerable groups. The UN has designated education as central in promoting global sustainability (e.g. UNEP 2019; UN 2019). Curriculum in schools needs to take up this imperative for planetary wellbeing in which the future of the human species is embedded. We need to reimagine what sustainability can be within the curriculum, such that ‘top down’ policy directions make space for ‘bottom up’ grassroots action at the local level. Learning *about* environment needs to be complemented by changing human practices in all our institutions and relationships: learning *through* ethical action to develop both new knowledge and new forms of practice to address the emergencies facing our planet. The implication for school curriculum is clear: school knowledge-work must include interaction with other species, shared ecosystems and geographical places. Such action starts locally, with understanding that all places are shared and connected.

A problem facing schools is the inadequacy of the Australian Curriculum (AC), including senior years curriculum (Eilam, Prasad & Widdop Quinton, under review), as a framework to enable students and teachers to address their ethical concerns by engaging in knowledge-in-action on environmental issues. Each of the three cross-curriculum priorities – “Sustainability”, “Aboriginal and Torres Strait Islander Histories and Cultures”, and “Asia and Australia’s Engagement with Asia” – can only be dealt with by being backmapped onto separate discipline-specific subjects. Backmapping does not allow sufficient options for treating these ‘priorities’ as important by taking seriously their multi-disciplinary complexities and uncertainties. What young people, and many other citizens, are calling for is robust, interdisciplinary, *proactive* knowledge work, enabling *ethical agency* to pursue sustainable futures, rather than walling schools off from key issues that require investigation and action. Aboriginal and Torres Strait Islander peoples also call for ethically robust knowledge work across curriculum (see Lowe and Galstaun, this issue).

In a previous *Point and Counterpoint*, focused on Climate Change Education (*Curriculum Perspectives*, April 2017), Stevenson, Nicholls and Whitehouse (2017) argue that:

Climate change should be understood as a complex social as well as scientific issue characterized by uncertain and context-specific knowledge.... [This] involves creatively preparing children and young people for a rapidly changing, uncertain, risky and possibly dangerous future. Just how dangerous totally depends on the actions we take today. (p. 67)

For education that addresses such risks, and that prioritises a future orientation for humanity and the planet, curriculum needs to build in new roles for local place and communities. Greenwood (2013) calls such education “place-conscious”. To re-balance ecological and human-social systems, and to shift views on what it means to be human, schools need to work *with* place and *with* communities. Gruenewald (2005) argues that such changes cannot be accomplished in-and-by schools alone, because education is captured within policy pressures and traditions: testing, vocationalism, credentialism, accountabilities and more. Engaging in knowledge work *with communities in place* is a strategy to avoid such capture. For students and teachers both to think *and act* on sustainability, they need to link – via student curriculum work – to knowledges of diverse communities as well as that of university specialists and other agencies. We need all stakeholders to contribute to knowledge work together.

In this paper, we start from the *ethical* premise that *action*-oriented environmental education is core to human and planetary futures. We suggest there are multiple curricular and pedagogic approaches for addressing this ethical challenge: some currently in place; others either forgotten or yet to emerge. We consider how schools, as part of their communities, can be central in expanding shared ethical commitments, taking a lead in constructing new ethically-informed goals and relationships in/for collaborative and knowledgeable pro-action.

Established and emergent directions for sustainability curriculum and pedagogy

Renowned sustainability scholar, David Orr, maintains that true ecological literacy is “radicalizing” (1992, p. 86) in that it focuses attention on *causes*, not just symptoms, of

detrimental impacts on Earth's ecological systems. Accelerating social, infrastructural and environmental crises press us for ethical citizenship that links local action to broad-based structural issues of sustainability. It concerns us, then, that a side-effect of teacher overwork and fatigue – in the current pressured climate of standardisation, high-stakes testing and 'teacher quality' discourse – can breed professional amnesia about ethical drivers for curriculum decision making.

It is important to recognise that there are a range of past traditions to build upon for viable and rich sustainability education. Formal environment education in Australian schools is long preceded by 60,000+ years of Indigenous education, as well as, in settler schooling, by a history of nature study, outdoor education and agricultural studies. Indigenous knowledges, and ways of knowing, are infused with ethical care for Country and sustainability practices – which continue to be marginalised in the Australian Curriculum (Lowe & Galstaun, this issue). The relational, collectivist perspectives of many First Peoples' kinship with their socio-ecological world are "familial, intimate, intergenerational, and instructive" (Tuck, McKenzie & McCoy 2014, p. 9). Learning about "Country" from local Elders of Australia's Aboriginal and Torres Strait Island peoples ought thus to be a major step in building just relations with First Peoples and their Land on which we live; it is also an important step for working towards sustainability. Dealing with changes to place, and working in new ways towards greater socio-ecological sustainability, requires reconciliation with, and learning from and alongside, Aboriginal and Torres Strait Islander peoples.

Land Education programs take a respectful approach by working with traditional owners to disrupt dominant human-centric and settler perspectives. They provide an admirable ethical framework for reconciliation and sustainability curriculum. The Sea Country project, as an example of Land Education, is based on the Great Barrier Reef (Whitehouse et al. 2017). This program blends western-style and traditional knowledges in place-based, experiential, relational and civic learning. Indigenous Elders, students, teachers, scientists, tourism providers, rangers, pre-service teachers and teacher educators collectively develop knowledge and skills to sustain the Reef community. Such approaches invite settler society to learn with and from Indigenous peoples, setting key agendas for such work. Relatedly, the 2019 Garma Festival Youth Forum developed an "Imagination Declaration" (2019; see also Shay, Woods & Sarra 2019) to follow up the "Uluru Statement from the Heart" (2017).

Serious sustainability work does require new forms of curriculum that disrupt entrenched thinking in pursuit of generative change. Yet some past precedents still have much to offer. Making sustainability central to the curriculum entails interdisciplinary, real-life education such as Dewey (1937/1997) emphasised in his learning-from-experience approach. Comber's (2016) critical place-responsive approaches are based on decades of academic partnership work with teachers and schools. Her "enabling pedagogies" highlight social and ecological justice and the empowering possibilities for sustainability-focused curricula. Bruner's (1965) "spiral curriculum" shows how to revisit complex organising ideas in curriculum planning. There are critical pedagogies in media education or across the curriculum (Steinberg & Down 2020), and Boomer's (1978/1992) 'Negotiating the Curriculum' to provide practical pointers on curriculum that activates student agency. Debates with an educational history of foregrounding student voice and agency (see Holdsworth 2010) continue to be reinvigorated in

Student Action Teams (Mayes & Holdsworth, this issue), and detail teaching practices helpful to newcomers to the idea. Such forerunners can be built on for sustainability education.

Taking up inter-disciplinary, issues-responsive projects – local, life-situated, inclusive and collaborative – provides the basis for students to be pro-active researchers as part of curriculum work (Brennan 2017; Zipin 2017; Milne 2016; and contributions from Milne, Mayes & Holdsworth, and Zipin in this issue). We argue that young people, marshalling knowledge toward sustainability, expand their participatory agency to reshape democracy (Henderson & Tudball 2016; 2017). An action dimension, in their curriculum work, positions young people to understand and build judgements needed to examine evidence, weigh up appropriate responses and test them in action. These are essential knowledge-*and*-ethics capabilities for citizens of the emerging future.

A number of environment-focused programs and projects have gained inroads into curriculum, including high profile programs such as the global Eco-Schools, the Sustainable Schools programs around Australia, and regional programs and award schemes. Edible school kitchen gardens and fauna-habit gardening, collaborative community action projects for revegetation and conservation, and citizen science-style monitoring programs provide increasingly popular curriculum enhancements. National actions such as Clean Up Australia Day and National Tree Day, and global initiatives such as Earth Day and World Environment Day, have become regular features on school co-curricular activity calendars. However, the marginalisation of sustainability work within the Australian Curriculum, despite the Cross Curriculum ‘Priority’, means that such programs and projects are one-off, dependent on individual interest, and so struggle to persist long-term. If these special sustainability efforts and their resources were better integrated into a more conductive curriculum framework, they would be more durable and viable (see Paige, Lloyd & Smith 2019).

We recognise that many committed teachers find room to *enact* curriculum in sustainability-themed programs and projects. Teachers have swum against currents of discipline-based and fragmented content knowledge, to foreground holistic social and ecological sustainability *processes*: e.g. at Silkwood School in Queensland (see Sustainable Schools Network: <https://www.ssn.org.au/>) and Cornish College in Victoria (<https://www.cornishcollege.vic.edu.au/sustainability/>). They provide models for whole-school sustainability-focused curricula, along with individual programs and pedagogies enacted by passionate teachers. Such socio-ecological learning has emerged and taken form in many projects and programs situated at what Somerville (2007) calls the “*contact zone*” between people, place, histories and cultures.

Some emerging practices signal inspiring new possibilities to reimagine sustainability in the curriculum, taking *ethical meaning-making* seriously. More-than-human thinking and being, as a challenge to human-centric presumptions and habits that both create and aggravate current environmental crises, provide further alternative paradigms for sustainability (Gough 2018). These perspectives do not displace, but do ‘de-centre’, human species. They challenge rigid binaries of culture/nature, human/animal and living/dead, thus contributing new possibilities for ethical reflection in curriculum knowledge work. Innovative curriculum emerges and develops as thinking shifts to

foreground the interconnectedness, in inextricably interwoven ecologies, of humans with other living and natural/material domains.

Building on the UN (1989) *Convention on Rights of the Child*, the participatory agency of young people in *co-constructing curriculum knowledge* has increasingly gained emphasis. When young people's capabilities are genuinely valued, and their participation actively engaged (beyond tokenism), rich sustainability *imaginaries* emerge: e.g. explorations and speculative fiction of *Climate Change and Me* collaborative research and curriculum development (<http://climatechangeandme.com.au/>). The *Common World Collective* of researchers and educators (<https://commonworlds.net/>) develops curriculum and pedagogies to enable children and teachers collaboratively to explore "common worlding" through experiences with other animals and in nature. Such place-responsive, intentionally non-human-centric approaches are increasingly incorporated into early childhood and primary settings. Traditional socio-ecological systems thinking takes on new dimensions, with older students, when framed in the view that 'we are in-and-of nature', treating all parts of our common world as interconnected – such as in "alltogetherness" or "one-health" approaches (see Cohn & Lynch 2017; Logan & Widdop Quinton 2018)). Emancipatory approaches such as Big History understandings of patterns, life and cosmic recycling of atoms, and conceptual tools such as thinking with "porous bodies" of weathering and watery-ness (Neimanis & Walker 2014), also support attending to more-than-human layers and interactions. Such re-conceptualised framings for knowledge activity open up new spaces for *ethicalised* curriculum work.

The above sustainability education examples include bodies, places, emotions, knowledges, connections and relationships interacting for complex understanding and pursuit of *social-and-ecological justice*. Such efforts do not discard valuable existing curriculum, but reframe it within an ethical, future-oriented, activist approach to sustainability education. They open spaces and opportunities for new knowledges, and ways of knowing, to emerge in connection with existing knowledge bases. Stretching and reshaping curriculum and pedagogy – seeking to enact sustainable relationships across places, people and other species – leads to meaningful-*and*-ethical knowledge work for addressing current and emergent socio-ecological realities, local and global.

Working towards lived ethics in curriculum and pedagogy

For such curriculum work to expand, teachers and students will need to identify a range of sources of relevant knowledge and wisdom – Indigenous, community-based, and social and natural sciences – to bring to bear on local issues and their connections to related issues in other locales. Integrated and inter-disciplinary curriculum approaches will need to develop, through whole-school participatory processes, to challenge the currently dominant disciplinary organisation of curriculum, especially in secondary schools. Such approaches would foreground collective investigations, including structured activities for ethical reflection, building on and extending previous knowledge and action. New processes would emerge for much closer interaction between schools and communities, involving capacity-building for collaborative inquiry, and finding ways to build community knowledge archives. There needs to be significant time for interdisciplinary and action-oriented local studies. This allows new links between existing and emerging knowledge to develop as students, teachers and

community actors together construct more robust ethical purposes for schooling that forges new relationships among humans, and – crucially – between humans, other species and place.

There are significant curricular and pedagogic issues when taking up the ethical challenges of capacitating students to work on *knowledge-in-action* for environmental sustainability. We see two sets of specific ethical challenges which young people, their teachers and communities need to address. The first is developing ethical relations with other species and with eco-systems, not just humans. To date, Australian schools have treated humans as separate from nature: we learn ‘about’ humans or ‘about’ the natural world, within a framework that perceives humans as ‘masters’ of a natural environment which exists primarily to supply human needs. Our ethics have been focussed on how we treat other humans, rather than raising questions of justice in our relations to the rest of nature. Deforestation, global warming, rising sea levels, rising levels of atmospheric carbon and other contemporary environmental crises all interrupt this assumption that humans are separate from natural planetary systems. What might *social-ecological justice* look like, here, now? How can local action make it possible? What pedagogies support young people, teachers and communities to address such questions?

The second set of ethical challenges is to develop commitment to socio-ecological justice that is not only private and personal but explicit and shared. Brydon-Miller and Coghlan (2019) talk about this in terms of moving between first, second and third person ethics. In schooling, ethical questions need to be embedded in social-pedagogical relations wherein teachers and students together unpack their “first person ethics” which are often not articulated. For curriculum, this implies pedagogies of explicit dialogue and reflection to build from private values to “second person ethics” that appreciate how one’s ‘own’ values form, inevitably, in social relations with others. From there it is possible – through structured reflection-and-action processes – to work towards collective “third person ethics”. Brydon-Miller and Coghlan develop this idea through an action-research focus: a highly relevant methodology for Environmental and Sustainability Education in schools and communities. We seek extension of such action-research from responsibility – and response-ability – primarily to/with other humans, to include local and planetary species, ecosystems and geographies. As people build knowledge together, *in/about social-and-natural environments*, they can evaluate whether/how this knowledge advances sustainable life-more-broadly. Learning to be in dialogues that share knowledge-in-action with diverse others – including disagreement that builds critical evaluation capacities and capacity to deal with conflict – develops ethical commitment to collective actions that respect rather than negate diversities.

If schools are to contribute to citizenries able to bring knowledge-in-action to bear on urgencies of global environment crises, then schools need to ‘take back’ curriculum in various ways. Such reclaiming of curriculum cannot develop overnight (even if it ‘needs’ to!); however, concerted efforts towards two simultaneous curriculum re-orientations would be expeditious: (a) making space in the existing Australian Curriculum while mainstream policy catches up with what many schools are already trying to do; and (b) supporting innovative curriculum/pedagogy around Sustainability that can inform new policy and practice. These efforts might include the following (and more):

a. Making space in the existing AC, to support:

- i. serious Aboriginal and Torres Strait Islander-led studies of Country
- ii. opening up options for integrated studies in science, local history and other academic subjects that can support inter-disciplinary work on what Zipin (this issue) calls “problems that matter”: in this case, questions of sustainability
- iii. students as researchers who work with a range of others to investigate and act upon local issues
- iv. using the space, skills and competencies of Civics & Citizenship as an approved subject for students to develop competence in action as citizens
- v. pushing the envelope on Sustainability as a cross-curriculum priority.

b. Developing alternative curriculum models to replace AC:

- i. working with diversely affected community groups to define issues outside the school, linked to local action, as core to curriculum
- ii. placing updated General Capabilities and the Cross-Curriculum Priorities as central in whole-school curriculum planning
- iii. developing a new, and robust, cross-curriculum subject that reverse-backmaps the traditional subject/disciplines into it
- iv. wider effort to develop new, future-oriented capabilities – exceeding the general capabilities currently on offer – that valorise collaborative work, knowledge-in-action, and, importantly, students and teachers as community researchers and ethical agents who care for environments of the future
- v. having the school, and groups of schools, generate ongoing community archives of their curricular action-research – involving school-community-specialist collaborations – that accumulate rich knowledge and strategic action plans towards future research-and-action.

Teachers have ‘responsibility’ for knowledgeable and otherwise capable future generations. For this responsibility to be more than ‘professional’ – to be *ethical* – teachers need to widen their perspective: to situate both younger and older human generations in *place*, and work towards sustainable futures of people-*in-place*. Pushing beyond current expertise in academic subject areas, students and teachers, together, need leeway and capacities to explore new place-based modes of knowledge, in relation to *emergent problems* of socio-ecological sustainability *in which schooling is emplaced*. In learning to nurture active, knowledge-*creating* student-citizens, teachers and teacher-educators need new forms of *ethico*-professional development, culturing ways to share knowledge, strategies and resources across schools, local communities, universities, other agencies.

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