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Promoting Physical (Ecological) Literacy through Physical Education: Everyone's Response-ability in a World Gasping for Air

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Abstract

Braidotti describes the world as gasping for air as collectively we face a range of socioecological challenges. Young people are important actors in these challenges, making schools a critical space for this work. Physical education (PE) can contribute through promoting relevant embodied encounters that develop students' physical literacies (PL). Noting the recent moves to extend the notion of a physically literate individual to include the ecological, alongside the Australian Curriculum that requires teachers to attend to their learning area, cross-curriculum priorities and general capabilities including *sustainability* and *ethical capabilities*, there are exciting possibilities for developing students' PL to confront these challenges. Despite these opportunities, for PE to contribute meaningfully, teachers must progress from PE represented by sport techniques, linear pedagogies and driven by competition to PE that engages students to think and act differently in the world, ethically, ontologically and epistemologically. Using autoethnography, this paper presents vignettes to outline current issues and possibilities for PE. Through a posthuman lens, positioning teachers and students as learners who are always *becoming*, with the capacity to *affect* and *be affected*, it is possible to achieve the intended curriculum and develop young people's capacities to make a meaningful contribution to the socioecological challenges we face.

Keywords: Physical education; physical literacy; environment; posthuman thinking; affect

Introduction — a vignette

I'm sitting in a cold gym (gymnasium or sports hall elsewhere) on a low, hard wooden bench that doubles as a gymnastics low balance beam. The light that the narrow, high windows lets in is distorted by their dirtiness and the wire mesh designed to stop balls breaking them, but simultaneously makes it feel as though we are locked in. The floors are a dark timber, littered with painted lines in preparation for the various games the teacher might decide to play. The walls are a grey brick, with targets painted on them, reminiscent of many school gymnasiums I have been in before. This space is removed from the other school learning spaces, often resulting in students arriving after the bell as they move between classes and buildings. The gym is physically closed off from the world around, the elements, to nature — a wooden floor and four walls designed to make the teaching of PE (often represented as sport) more efficient and contained. No uneven ground, no wind, no mud and a PE teacher's dream when it comes to voice projection and "crowd control." But it is also closed off in other ways, meaning that no one else really knows what goes on in the name of PE in that gym.

The students dribble in, ready to undertake their PE lesson. They know what to expect, as the program sets out clearly that they are beginning a unit of basketball, having just completed

volleyball, then soon to move onto hockey. Most know how this lesson will play out, with a focus on learning skills, executing drills, then playing a game, although none of the students will likely hold any responsibility for thinking deeply about it. A few rush in, eagerly gathering around the teacher, and ask if they can take a basketball from the rack and start playing, moved by the knowledge they will be able to run freely and bounce a ball with friends, or that it connects irresistibly with their identity as a “baller.” For others, it is about going through the motions. Some are not wearing correct sports uniform and wave their notes from home under their teacher’s nose — a head cold, a strained hamstring from footy on Saturday, a migraine — and then there are those who enter the gym more slowly and beg their teacher’s forgiveness for not being changed. Their uniform is in the wash; or they simply forgot, intentionally or otherwise. The teacher sits the unchanged students down on the wooden bench at the side of the court to watch proceedings. The lesson begins.

Imagine this scenario, repeated across the day, across gyms, across many school contexts. As I reflect on the lives of young people, I ponder where this experience “fits” for every student, especially when in places like Australia, games and sports reflect only one of the twelve focus areas that should be taught through health and physical education (HPE) (ACARA, 2024a). How does it relate to the formal curriculum; how does it engage students to want to learn, inspire them and make sense to them; and how do they find meaningful emotional and/or spiritual connection with PE? Moving my thoughts beyond the gym, I wonder how PE might do differently in a world that is calling for our attention and what contributions it could make to developing physically literate young people who think differently about the world. How can PE meaningfully contribute to their futures and that of this planet?

This paper offers a provocation to reframe positioning in relation to PE in schools in the face of the compelling socioecological challenges that confront us all and within the neoliberal presses of schools that draw teachers’ attention to external accountability measures (Stevenson, 2017). Welch et al. (2021) reflect on how making links to the environment in HPE might also help shift some of the individualistic and risk-based paradigms that dominate the field. By association, this also offers a view to an expanded interpretation of physical literacy (PL) that includes the ecological. Rosi Braidotti’s posthuman thinking provides excellent impetus to begin this work (2019) and in speculating how we might reimagine the discipline within the remit of the current curriculum that encourages teachers to think beyond the bounds of their learning areas. This speculation is brought to life through autoethnography.

Autoethnography through vignettes

This paper uses an autoethnographical approach that leans on Ellis and Adams’ (2014) principles for writing autoethnographies. These include using personal experience and knowledge of existing research to enable description and critique of cultural experiences and utilising insider knowledge to break silence and reclaim voice (2014). As a teacher and teacher educator with lengthy lived experience in the field of HPE, autoethnography and narrative vignettes highlight personal experience and observations and provide a view to an alternate vision through storytelling, in the hope of stimulating new ways to practice (Holman Jones et al., 2016). Autoethnography allows the author to make sense of some of the varying practices in PE and encourages reflexivity and critique of some of the accepted cultural norms of the field (Holman Jones et al., 2016).

Troubling physical education

As depicted through the opening vignette, PE in schools today — especially secondary schools — is too often stuck in the past, despite policy directions in Australia that point to a futures orientation (ACARA, 2024a). Although PE research has long been working at shifting from a

Eurocentric sport, games, skills and fitness focus that has served to alienate many students (e.g. Kirk, 2020; O'Connor & Alfrey, 2015; Tinning, 2004), practices within gyms in many schools (but not all) remain untouched. Back in 2009, Lawson suggested that PE was “out-of-step with today’s global realities” (p. 93). In 2010, Kirk concurred, recommending that major reform is required for a future(s) PE. In a powerful passage from his book *Physical Education Futures*, Kirk (p. 140) speaks to the nature of PE in schools:

Physical education is, I have claimed, the most institutionalised of school subjects. Furthermore, the id² of physical education-as-sport-techniques, with its molecularisation and abstraction of subject matter, its child-centred and egalitarian philosophy and its aspiration for universal lifelong physical activity, is a powerful and obdurate but incoherent construction of school knowledge relating to obsolete forms of physical culture, with consequent problems for transfer of learning, standards of excellence and cultural transmission and renewal.

A plethora of research has recognised the inequitable opportunities for learning in PE as “intractable” and “wicked” (Riley & Proctor, 2022, p. 268); PE itself has been described as a “programmable lemon” (Locke, 1992, p. 363), its purpose often seen as confused and in need of reorientation (Hawkins, 2008), and in some cases, a “political football” (Johnrose & Maher, 2010, p. 15). At the heart of this issue is not only the lack of clarity for practitioners about what PE *is*, *does* and *should be* but also the subsequent experiences for students that are sometimes disconnected from their daily lives — past, current and future and that do not necessarily stimulate engagement with PE emotionally (Rudd et al., 2021).

In the decades since scholars began talking about the problem that is PE, many have attempted to trouble the taken-for-granted notion of PE as games, sport and fitness and endeavoured to bridge the theory-practice divide that occurs between the official curriculum and what happens in schools. Leaning on critical scholarship, academics have explored models-based practice or instructional models (e.g. Casey et al., 2020; Metzler, 2011), to encourage a shift from a skill-based approach to teaching PE inclusive of the cognitive and affective learning domains. Likewise, a sociocultural lens has also been used to explore how PE might be enacted in more socially just and less performative ways (e.g. Azzarito et al., 2017; Lynch et al., 2020; Macdonald, 2002). This includes pedagogical approaches such as meaningful PE (e.g. Brown & Payne, 2009; Ni Chroinin et al., 2020; O'Connor, 2019), activist approaches (e.g. Shilcutt et al., 2024; Walseth et al., 2018) and pedagogies of embodiment (Aartun et al., 2022). We have also witnessed approaches that lean on a socioecological framing to understand and engage students in physical activity in the environment beyond the confines of the school (O'Connor et al., 2012; O'Connor & Alfrey, 2015). All of these have contributed to the ongoing discussion about what PE can and might do and suggest that we are making some inroads into the development of a contemporary and meaningful PE.

Despite this important work, there are many and varied reasons why we don't see significant and sustainable change in school PE. For example, teachers' lack of time and resources to learn about and enact sustainable change to their pedagogy and thinking are significant barriers (Casey & MacPhail, 2018), along with PE teachers' histories of and orientation towards sport that are difficult to shift (Mordal-Moen & Green, 2014; Svendsen & Svendsen, 2016). Related to the aforementioned is also early-career PE teachers' lack of engagement with formal policy (curriculum) in pedagogical decision-making (Peters, 2021). Using the analogy of the tool belt, anecdotally, teachers often view these models and framings as adding another tool — increasing the repertoire of skills, and usually with a strong underlying contextual knowledge of their school and students, that is, “that would work well with my students.” However, the intention (or hope) of most researchers and authors was likely deeper than that — to effect teachers' epistemological positioning in relation to how students learn and what is important to learn.

Concurrently, as PE has endured its identity struggles, and strived to foster change at the coalface, much has changed in the world (IPCC, 2023). The urgency to act around socioecological challenges has increased and has become widely recognised as everyone’s problem (White et al., 2024). Many have provided contributions to working with these challenges, often through the sciences (e.g. Datta, 2024; Jukes & Riley, 2024), and more recently, with a strong call for valuing Indigenous ways of understanding and caring for land as a contribution to the health of the planet (e.g. Riley & Proctor, 2022; Whatman et al., 2017; lisahunter et al., 2024). The latter is not an intentional focus of this paper; however, it is difficult to think exclusively about sustainability without acknowledging that for many thousands of years, Indigenous peoples have done this work, and if mainstream society were to return to the philosophies of these peoples, it would make a strong contribution to sustainable ways of living on our planet. The work of Rosa Braidotti makes a significant contribution to this thinking differently.

Posthuman thinking — tools for thinking provocatively

I offer here a brief introduction to Rosi Braidotti’s work, not as a critique, but rather as an overview of it as a thinking tool, in line with her plea to think differently in *Posthuman Thinking* (2019). Notwithstanding the thoughtful critiques of her work (e.g. Biswas Mellamphy & Vangeest, 2024; James, 2017; Susen, 2022), the remit of this paper is not to challenge Braidotti’s thoughts or engage in debate, but rather, to think productively and creatively with some of her key ideas — something that she has challenged us to do.

According to Braidotti (2019), we are in posthuman times, positioned amongst the challenges of advanced technology, capitalism and climate change. She describes the conditions as the convergence of posthumanism and post-anthropocentrism (Braidotti, 2019). Posthuman thinking critiques “the humanist ideal of ‘Man’ as the allegedly universal measure of all things,” whilst post-anthropocentrism “criticizes species hierarchy and anthropocentric exceptionalism” (Braidotti, 2019, vii). This posits the environment as being more important than ever in our thinking as “we-are-(all)-in-this-together-but-we-are-not-one-and-the-same” (p. 34). By *we*, she uses a broader, more open and collective conceptualisation that is “multiple and non-hierarchical” (2019, p. 2), non-binary and inclusive of the human, non-human and Other (2019).

Braidotti positions humanity as both vulnerable and insurgent (2019, p. 54), imploring us to be brave and creative in taking responsibility for this world we inhabit. However, she is at pains to express that planning for a future requires knowledge from those marginalised and in the minority, which gives rise to a broader range of voices in undertaking this challenge. Braidotti’s work in posthuman thinking offers us a tool to help us with our present complexities (2019) and an opportunity and the impetus to take action in a world she claims is “gasping for air” (2023, p. 9).

Braidotti (2019) describes humans as “relational beings, defined by the capacity to affect and be affected” (p. 27). By this, she disconnects from an individualised version of relations and affect and describes a relational process that speaks to interconnections as thick and dynamic webs, to signify that the relational does not simply encompass the human-to-human but also “*bios* and *zoe* forces, as well as geo- and techno-relations that defy our collective and singular powers of perception and understanding”¹ (Braidotti, 2019, p. 27). Braidotti’s suggestion that we can “affect and be affected” (p. 54) in this relational way implores us to engage with and enact her “affirmative ethics” — the “pursuit of affirmative values and relations” (2019, p. 136) in our relationship with “*zoe/geo/ techno*” assemblages in a collective way, in the face of the challenges of advanced technology, capitalism and climate change. Strom and Mills (2021) describe affirmative ethics as the

¹Bios “refers to the life of humans organized in society, while *zoe* refers to life of all living beings. Bios is regulated by sovereign powers and rules, whereas *zoe* is unprotected and vulnerable” (Braidotti, 2019, p. 3). Geo- refers to geological and techno- to technological aspects. Together, Braidotti refers to the *zoe/geo/techno* as an assemblage (p. 44).

enactment of “a collective, political praxis of hope, compassion, and transformation” (p. 190), and describe the enactment of affirmative ethics (p. 191):

Affirmative ethics does not ignore or gloss over pain, trauma and suffering but rather directly engages with it to create ways of becoming–otherwise. Specifically, enacting an affirmative ethics involves processing pain and trauma by examining our current conditions — including and especially the flows of power involved — and generating shared knowledge from them to forge new possibilities. In so doing, we move past good/bad dualisms and rework negativity outside of these binaries, transforming them, and in the process, producing different knowledges, subjectivities and ways of living together and relating to each other. In the relational generation of new affective capacities, we create adequate understandings of ourselves, each other and the world.

This helps to confirm posthumanism’s potential for positive possibilities, or a strengths-based approach (ACARA, 2024a), rather than being posed amongst the various risk discourses that have driven approaches to HPE and young people over the decades, particularly in relation to health and the environment (Taylor et al., 2016).

Braidotti’s call to action feels urgent. At once, it feels like a return to values of care, community service and hope, whilst simultaneously calling us to contest and challenge inequalities, injustice and push back against a “consumerist society that sells youth and beauty while relentlessly consuming all that lives and commodifying even our aspirations and desires” (2023, p. 10). But it is more than that. Braidotti conceives of a future that is “creative not conformist” in “being responsible for the world” (2023, p. 11), but to achieve this, she challenges us to understand ourselves differently — not in a binary of human and nature, but rather in a relationship with nature. In fact, Braidotti speaks of the posthuman subject being simultaneously in relation to “the Earth — land, water, plants, animals, bacteria — and to technological agents — plastic, wires, cells, codes, algorithms” (2019, p. 27–28) — an assemblage of “zoe/geo/techno” (p. 52).

With significant socioecological challenges on our doorstep, we must act with some urgency. This paper calls teachers to action in considering how they might support and activate students’ affective and relational capacities through PE; to aid students in questioning and reflecting on how discourses are taken up around advanced technology, capitalism and climate change; and to rethink their connection with the environment. I look to Braidotti (2019, 2023), Deleuze and Guattari (1987) and others to help frame the concepts of affect and relationality.

Affect and relationality

Affect is a ubiquitous term, used readily in the field of PE as a means of representing one aspect of the work done in its name. The three learning domains — psychomotor, cognitive and affective (Bloom et al., 1956) — have long represented the breakdown of learning, although the cognitive learning domain has often taken priority, undervaluing the affective domain particularly (Harrison et al., 2017). The affective domain has been defined loosely, being referred to variously as a range of psychological characteristics or emotions that include but are not limited to “interest, motivation, perseverance, valuing, caring, resilience, and joy” (Kirk, 2020, p. 151), enjoyment and self-esteem (Bailey et al., 2009), self-confidence and self-efficacy (Pozo et al., 2018), attitudes (Hoque, 2016) and value systems (Eiss & Harbeck, 1969).

Whilst this article uses affect to describe emotionality, it leans on a more nuanced understanding in alignment with the work of Deleuze and Guattari (1987) and Massumi (2015), where affect is prior to consciousness, preceding emotions. An affective response “is often felt before it is thought” (Kokorudz, 2022, p. 257), unintentionally and involuntarily (Ellsworth, 2005, p. 26), preceding cognition (Massumi, 2002). Massumi (2002) speaks to the “sheerness of

experience” where “perception is eclipsed” and where “sensation is a state in which action, perception, and thought are so intensely, performatively mixed” (p. 97–98).

Affect is understood to be an energetic force that moves us (Strom & Mills, 2021). Tinning (2004) speaks of “affective ‘sen-sations’” (p. 191) that resonate with us deeply and that are embodied in the look on a learner’s face when they sense something new, hitherto unthought and unfelt, in emergence (Ellsworth, 2005). This transformational process is *becoming* (Deleuze & Guattari, 1987) and represents a change in the body as it interacts and is affected by another body in an encounter (Kim, 2023; Markula, 2008). In Deleuzian terms, a body means almost anything, including “an animal, a body of sounds, an idea; it can be a linguistic corpus, a social body, a collectivity” (Deleuze, 1988, p. 127) — human, non-human or Other (Braidotti, 2019).

Affect, as described above, only occurs in relation to others. Law and Singleton (2013) suggest that everything is in a relationship to everything else, which, ontologically, invites us to think about ourselves differently, always in relation to something or someone else, as assemblages. An assemblage can be described as “gatherings of humans and components of the physical world” (Kara, 2023, p. 123), highlighting the Deleuzian notion of “body,” used earlier, as meaning anything. In reflecting on these notions of affect, relationality and assemblage, I can’t help but recall an encounter of my own, being transformed as a learner — or *becoming*. Recently, on country with university colleagues — the sensations were inexplicable and have urged me to learn more. On the traditional lands of the Gunditjmarra peoples, with an Indigenous tour guide who was storying how Indigenous people lived on those lands prior to colonial settlement, we walked softly amongst the ruins of traditional stone houses. This assemblage — an entanglement of affect — being a white woman of settler origin, standing on country and learning amongst others, resonated loudly with Ellsworth’s description of the “sensation of simultaneously being with oneself and being in relation to things, people, or ideas outside oneself” (2005, p. 16), of not *having* the experience, but *being* the experience (p. 26), after which, the personal emerges (Massumi, 2002). The notion of relationality is central here — in an assemblage with the human and non-human — in demonstrating affect and the powerful *becoming* that can occur when learning in “place.” The question is how we might support more of this type of experience in schools.

Young people and schooling

Taking up these ideas from Deleuze and Guattari, Braidotti and others, schooling seems to be an obvious place to embrace Braidotti’s call for minority and marginalised knowledge (2019) to help with the socioecological challenges. Young people’s voices are often marginalised, and in the minority (Dunlop et al., 2021), they are often “Othered,” yet they are pivotal to the present and future of this world. Schooling is an ideal point of contact for all young people and one where we see students engaging to varying extents in learning and in having their voices heard, given the opportunity. The work of the likes of Mayes and Center (2022), who highlight students’ climate justice literacy through their use of humour both online and in person when demonstrating, and Mayes and Holdsworth (2020), who challenge the discourses that position children in fear and as pawns of activism, emphasises that there is plentiful research that can help us see that students have much to offer in the way of hope in this sphere. Borner et al.’s work (2021) with marginalised youth on the urban periphery of Brazil, engaging with the everyday issues that impact their lives, for example, resource insecurity, the environment and the effects of climate change, is an example that embraces a posthuman lens. The same lens can also frame the everyday practices of PE but will require ethico-onto-epistemological² shifts for many teachers and consideration of the tensions that exist within the constraints of a school system and its policies.

²Barad (2007) uses the term ethico-onto-epistemology to describe the “intertwining of ethics, knowing, and being . . . as the becoming of the world is a deeply ethical matter” (p. 185). She poses ethics, ontology and epistemology as inseparable in our engagement with the world.

Locating this work in the formal physical education curriculum

There is no doubt that what Braidotti proposes provides a tension for teachers in the highly regulated space of teaching, amongst policy and accountability requirements and the pressures from stakeholders and given the location of their work within a much larger system. Finding a space to do this work means a repositioning of ethico-onto-epistemological framing of learning — of thinking differently about the purposes of schooling, the way in which students learn, and in viewing the world differently, always relationally in a more-than-human world.

With that tension in mind, the Australian Curriculum (AC) HPE theoretically offers spaces in which the work of responding to socioecological challenges can be done. Organised into disciplines or *learning areas* as we often find curriculum due to the specialisation of knowledge within each, the AC also asks its teachers to attend to *cross-curriculum priorities* and *general capabilities*. It is through these additional requirements that teachers should find connections to their disciplines that are related and meaningful to the socioecological challenges confronting us. Figure 1 sets out the requirements of teachers of HPE according to the official curriculum, noting that *learning areas* have explicit curriculum, as do the *general capabilities*, however *cross-curriculum priorities* only offer guidance material in the form of “organising ideas” (ACARA, 2022, p. 5). HPE as a learning area is also underpinned by five key propositions designed to assist teachers in actualising the curriculum documents. These are *focus on educative purpose, develop health literacy, take a strengths-based approach, include a critical inquiry approach* and *value movement*. These five propositions should guide program planning and help teachers select appropriate pedagogies to enable students to meet the curriculum outcomes (ACARA, 2024a) and have great potential. Notwithstanding the AC’s desire to see HPE integrated due the obvious connections, this paper focuses specifically on PE for numerous reasons — due to the embodied nature of work done in its name; its relationship to PL; to narrow the focus of the discussion; it is where history tells us we have plentiful opportunities; and in some states and territories of Australia, PE remains separate from health when timetabled in schools. I note here that I am a strong advocate for the integration of health and PE.

Drawing attention to the cross-curriculum priorities, teachers of PE in Australia have a policy obligation to teach about *sustainability, Aboriginal and Torres Strait Islander histories and cultures* and more. For all teachers from Foundation (Preparatory/Reception) to Year 10, the role of the cross-curriculum priorities is to “support and deepen student engagement with learning area content and are best developed within the context of learning areas” (ACARA, 2024b). Without a specific curriculum to guide it, the AC sets out the contribution that HPE as a learning area should make to *sustainability*:

In Health and Physical Education, students explore how they can interact with natural and outdoor settings and with people in their social networks and wider communities. They consider the role of these connections in supporting the wellbeing of individuals and the community now and into the future. Students develop their world view by exploring diversity, social justice and consumerism as they relate to the promotion and maintenance of health and wellbeing. Through movement experiences, students participate in physical activity in a range of settings, including natural and outdoor settings. They appreciate the interdependence of the wellbeing of people and the environments they live within.

It is clear there are opportunities here to shift PE from indoors to interacting more meaningfully with natural and outdoor environments, engaging with Others both within and beyond the school setting, understanding the interdependence between wellbeing and environment and exploring diversity, consumerism and social justice (ACARA, 2024b). Combined with exploring *Aboriginal and Torres Strait Islander Histories and Cultures* and the general capabilities such as *ethical understanding, personal and social capability* and *critical and creative thinking*, there becomes an

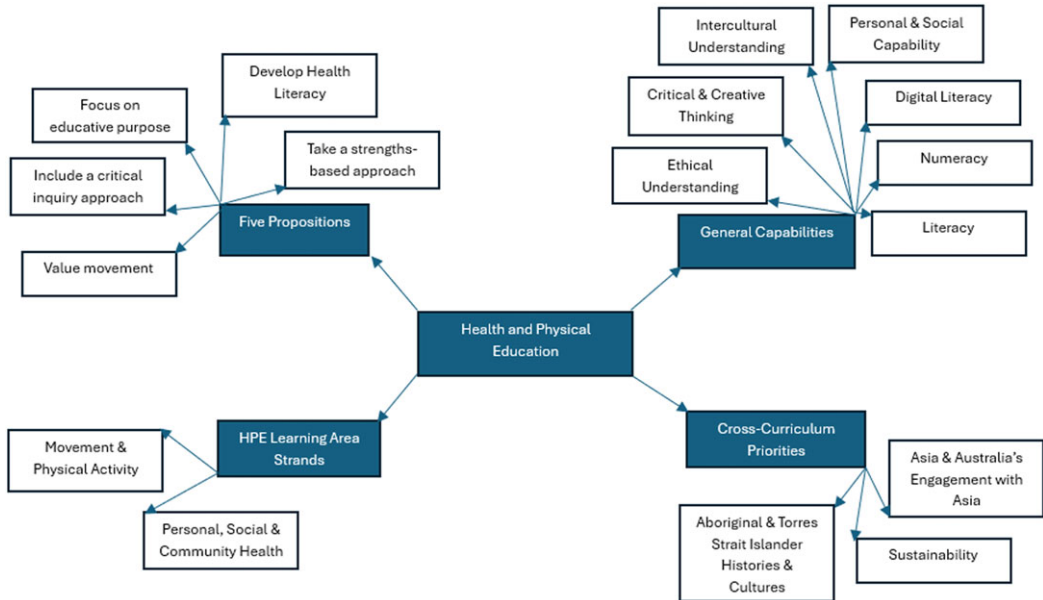


Figure 1. Diagrammatic representation of the Australian Curriculum: HPE.

imperative to develop students' ability to engage meaningfully in and through physical activity to become physically educated and physically literate young people, capable of *being* differently to how school PE currently positions them, if they are to be agents of change.

The role of physical literacy

PL, as a long-contested notion in the field, is a socially constructed term that has seen numerous interpretations and definitions, served various purposes and supported numerous agendas (Harvey & Pill, 2019; Young et al., 2023). I do not wish to represent PL simplistically but also do not presume to enter the debate here. Instead, I lean on Young et al.'s (2023) notion that the conflicting definitions and purposes can in fact sit somewhat agreeably side-by-side (with overlap) as *physical literacies*, which can be used to enable a view of the various elements that describe a physically educated young person. I therefore adopt a holistic definition that enables the inclusion of the physical, psychological, social and cognitive domains of learning as represented within the Australian Sports Commission's Physical Literacy framework (Sport Australia, 2020a). Sport Australia's position statement (2020b) suggests:

PL is about developing knowledge and behaviours that give children the motivation and confidence to enjoy active lifestyles. Establishing active habits in children sets them on the path to happier and healthier lives, paving the way for a more productive Australia.

In addition, PL is considered an "embodied capability" (Macdonald & Enright, 2013, p. 2), which speaks loudly to the idea of *being* and *becoming* that have been discussed thus far, but with a caveat that this is relational rather than the individualistic notion insinuated by developing a capability or behaviour.

To further develop the notion of PL, Carl et al. (2024) propose that the concept be reconceptualised from the existing physical, psychosocial/affective, social and cognitive domains to include an ecological domain. This proposition is driven by the absence of reference to the

pressing ecological challenges within those domains, the growing impact of humans on the natural environment and how the changing environment has impacted humans in relation to physical activity (2024). Additionally, Carl et al. (2024) highlight that a reconceptualisation would “further enhance the complexity of the PL domains and add further interdependencies between the domains” (p. 317), for example, cognitive engagement in decision-making about the bidirectional impact of selected activities on the ecosystem.

Although some official curriculum documents around the world have leant on the term PL as a way of articulating goals for (health and) PE, the AC does not mention the term. Rather, its contents point to what it means to be physically literate, which includes not only the discipline knowledge within HPE but the associated general capabilities and cross-curriculum priorities such as *sustainability*. There have been motions to include as a sixth proposition for HPE (Brown & Whittle, 2021) based on its capacity to broaden the ways in which HPE is understood and enacted; however, to date, this has not occurred, and it appears that PL’s various guises and lack of agreed definition might have something to do with that. If we take as given Braidotti’s notion that the planet is calling us to attention and we need to act now, it seems logical that a physically literate person requires, amongst other things, knowledge and understandings of the co-implications of being physically active in and with the environment relationally, especially in a changing environment.

Physical education and posthuman thinking — a vignette

I’m sitting on the grass on the edge of the oval. The teacher asks the students to close their eyes and let their other senses guide them for 30 s. I follow suit. I can smell the refreshing lemon scent from the damp eucalyptus trees being picked up by the autumn breeze after rain overnight. The students notice this too. Now the teacher asks them to open their eyes and think about the signs that Autumn might be coming to an end. One student notes that the yellow wattles are dying off. A couple more say they have felt the air temperature changing over the last couple of weeks. They reflect on how the plants know, which brings the conversation back to the Indigenous seasonal calendar. The teacher then draws them back to think about how these spaces were used for recreation by those who came before us.

The students are mapping places in the school to situate physical activity opportunities in the space. They are exploring built and natural spaces within the grounds whilst maintaining one eye on the results of the surveys they undertook of their peers from Years 7–12 around “sustainable physical activity passions.” Meshing the two provides a rich but meaningful challenge as they consider everything they have been learning about the socioecological challenges in geography and science; the environment-focused slam poetry they have been excitedly producing in English; and the natural material sculptures in art. The cross-curricular theme lends itself to deep immersion in the project and I can see this playing out through rich conversations, measurements, map-drawing and plenty of photographs being taken. From here, they will move into the community to map options for sustainable physical activity, before beginning to petition a selected stakeholder for changes that reflect their findings.

A group are huddled around a particular tree with lots of animated conversations going on. I move closer to hear them talking in lively, wondrous tones about the brown pods on the Acacia and how they have been harvesting these wattle seeds for roasting and grinding in Food Technology. One opens a plant identifier app on their phone. Some are collecting pods that have dropped to the ground to take back to the Food Technology room, whilst another student reminds them that this is a food source that has been used for tens of thousands of years by Indigenous peoples. I am awestruck by their engagement as they each build on what the others are saying in informed ways. They have learned to move slowly, to appreciate with all their senses and to note these feelings in their project notebooks.

The students move on, with the decision not to disrupt that area of the grounds with their physical activity ideas because of the importance of those bushes and trees to the ecosystem and as a food source for their cooking and for future students. They continue to map the school environment, noting areas best left untouched, and the areas they feel are appropriate to the various forms of activity their school peers say they enjoy. I watch in admiration, nearly forgetting I am listening to Year 8 students.

Next lesson they have decided to pitch their ideas to gain feedback from their class peers as a cyclical process of planning, actioning, reflecting and reviewing, followed by the enactment of the ideas garnered.

The vignette above is ideological, but not something completely unimaginable. It envisions a different PE to what is often experienced in schools. At first read, a PE teacher or student may not recognise this as PE — no replication of sporting techniques — skills, rules and games; and not with a pedagogical approach driven by the teacher as expert, which positions the educator in a powerful position and students as passive recipients, that is, no “loud pedagogy” (Rudd et al., 2021, p. 295). Instead, it attempts to integrate knowledge systems — ways of knowing and doing, and discipline knowledge so that students may have the opportunity to view the world, schooling, PE and the environment through a more complex lens (Tovar-Galvez, 2022, p. 2) — with a different ethico-onto-epistemological framing. Students have a contribution to the direction of the learning in what Rudd et al. would term a “soft pedagogy” (2021, p. 295).

The lesson described is embodied, experiential and holistic. The students integrate their understandings in different ways, with a shared goal that can be achieved in diverse ways — only as diverse as the learners in the class. The students feel safe in this PE as they go about the business of creating their own narratives and developing and articulating their identities in this space (Aartun et al., 2022), with and amongst others.

The vignette describes various assemblages — trees, pods, students and past experiences; scents, wattles, feel of the air, students and knowledge, both modern and traditional. The students see, smell, touch, hear, feel and imagine — they are attuning with the environment. They bounce off each other, building knowledge, developing relationships and making connections between human and more-than-human. They appreciate the earth’s cycles, the history of place, and apply this thinking to making decisions about physically active lifestyles. Soon they will enact these, but in a way that is more relational and deeply connected to the environment than might otherwise be the case. This is the becoming of the physically literate individual, affecting others and being affected.

Enacting the written curriculum — activating a policy voice

I locate this vignette within the AC and more specifically in the *Movement and Physical Activity* strand of HPE, which is often understood as PE, as distinct from the *Personal, Social and Community Health* strand, which is better known as health. Table 1 represents potential *content descriptions* from this strand, then moving across the table, includes aligned links to the cross-curriculum priorities of *Aboriginal and Torres Strait Islander Histories and Cultures* and *Sustainability* and a raft of relevant *General Capabilities*. This is not suggestive that these are all specifically taught and assessed within the one unit, but rather, shows the connections a PE unit such as this might be able to make when viewed from a single discipline perspective.

But as with all curriculum endeavours, the challenge is always in the *how* and *why* rather than the *what* to teach. If we are to work towards the goal of developing physically literate young people, who think differently about the world and who are ready to take on pressing socioecological challenges, it is important that teachers are activating their policy voices through enacting curriculum in creative and productive ways.

A transdisciplinary approach resonates clearly with the ideas discussed so far in this paper and the above vignette. However, the secondary school structure provides challenges to undertaking meaningful transdisciplinary work that offers holistic learning for students, due to the siloed

Table 1. Australian Curriculum alignment with vignette

Strand: Movement and Physical Activity Content Descriptions	Cross-Curriculum Priority: Aboriginal and Torres Strait Islander histories and cultures	Cross Curriculum Priority: Sustainability	General Capability:
AC9HP8M01: analyse, refine and transfer movement skills in a variety of movement situations			Literacy Digital Technology (investigating) Personal and Social Capability
AC9HP8M04: participate in physical activities designed to improve fitness and wellbeing to investigate the impact of regular participation on health, fitness and wellbeing			Literacy Numeracy Critical and Creative Thinking (inquiring & reflecting) Personal and Social Capability
AC9HP8M05: participate in physical activities that utilise community spaces and outdoor settings, and evaluate strategies to support increased use of these spaces	A_TSICP1 First Nations communities of Australia maintain a deep connection to, and responsibility for, Country/ Place and have holistic values and belief systems that are connected to the land, sea, sky and waterways. Elaboration: investigating different approaches to custodial responsibility for Country/ Place used by First Nations Australian communities to support the use of local settings and spaces for physical activity while protecting the environment.	SS2 Sustainable patterns of living require the responsible use of resources, maintenance of clean air, water and soils, and preservation or restoration of healthy environments. Elaboration 1: investigating different approaches to custodial responsibility for Country/ Place used by First Nations Australian communities to support the use of local settings and spaces for physical activity while protecting the environment. Elaboration 2: promoting an understanding of minimal-impact outdoor recreation in the local area.	Literacy Numeracy Critical and Creative Thinking (analysing) Digital Literacy (practising digital safety & wellbeing); investigating) Ethical Understanding (understanding ethical concepts & perspectives) Intercultural Understanding Personal and Social Capability
AC9HP8M06: design and justify strategies to increase physical activity levels to achieve health and wellbeing outcomes			Literacy Critical and Creative Thinking (generating) Digital Technology (investigating) Personal and Social Capability
AC9HP8M09: practise and apply leadership, collaboration and group decision-making processes when participating in a range of physical activities			Literacy Digital Literacy (creating & exchanging) Ethical Understanding (Responding to ethical issues) Personal and Social Capability

nature of learning within disciplines as subject areas. Consequently, this paper has attempted to address the work inside of PE, inclusive of the capabilities and cross-curricular priorities recognised as relevant in policy, but with students making connections to other disciplines organically. The vignette offers possibilities that challenge the common, didactic approaches based on instilling information, which are not necessarily the answer in a futures-oriented curriculum. Researchers reporting on schools' responses to environmental challenges such as climate change education, suggest that "scientific knowledge is not a strong indicator or driver of change in the attitudes or behaviours of young people" (McGimpsey et al., 2023, p. 2), so it is shifting students' and teachers' ethico-onto-epistemological positioning that is key.

Shaping the curriculum in motion — attuning with the environment

To achieve the ambitions described in the vignette, it also requires that the curriculum be reframed ontologically, so that it is viewed as fluid rather than fixed, and as such, we might see the curriculum (and students) as *emerging* and *becoming* (Deleuze & Guattari, 1987), which reflects the world more accurately than a static document might. Kim (2023) provides examples of such work in early childhood, where the curriculum is described "as in motion" (2023, p. 72) in contrast to viewing the curriculum as "fixed, permanent, and predictable" (p. 72). If curriculum is seen as always changing and becoming, or a process, "with unknowing potentiality" (Kim, 2023, p. 72), it calls not only for different pedagogical approaches to drive it but also an epistemological shift in thinking about how learning occurs. This doesn't mean that the curriculum is forgotten, but rather, the teacher holds that in mind as they structure the learning experiences or learning encounters, in which, both teacher and students are *becoming* as learners.

Central to Kim's "curriculum as in motion" are Deleuze and Guattari's notions of *affect* and *becoming*, which reinforce curriculum making as occurring through affect and in a process of becoming — transformations in thinking that come about "through encounters, movement connections and interactions" (Kim, 2023, p. 72). Kim emphasises that becoming is not imitative, but a process of creating new, rather than repeating the same (2023, p. 72). This requires from teachers what Ingold (2017) refers to as "leading out" which opens opportunities for students to learn without "pre-determined outcomes or fixed end-points" (p. ix). The vignette describes a shift where, students are working with a shared intention, but they have planned how they will get there and the teacher helps to facilitate boundaries (think accountability, child safety and risk management obligations in schools) and opens more questions than they do answers. This is somewhat removed from PE as it has been represented in schools and resonates with Rudd et al.'s (2021) "soft pedagogy" (p. 295), with students as active participants in the direction of their own learning, not unlike Kim's "curriculum as in motion" (2023, p. 72).

Viewing the curriculum in this way aligns with Braidotti's call to action in several ways. By adopting her affirmative ethics, we offer students different ways of engaging with becoming physically educated or literate. We hope that viewing curriculum as emerging from the students enables teachers to engage students with opportunities to produce "different knowledges, subjectivities, and ways of living together and relating to each other" (Strom & Mills, 2021, p. 191), inclusive of the human and non-human. Our goal as teachers is to configure the context through relational experiences to help *move* our students, to help develop their thinking and to support their transformation "to being responsible for the world" (Braidotti, 2023, p. 11). In contrast to the opening vignette, teachers would shift from the prescriptive, conformist and imitative version of PE-as-sport that we currently see in schools, with teacher-directed pedagogies that inhibit opportunities for transformative and relational experiences and shift to thinking about the sorts of engagement that might *move* students.

Being responsible for the world is not about shifting responsibility to the shoulders of young people, but instead, helping them to attune in a deeper way with the environment. Welch et al.

(2021, p. 351), like Ingold (2017), describe this as a “leaning in,” to promote “a deep sensory and even spiritual sense of care for others” (Welch et al., 2021, p. 351). In alignment with Braidotti’s posthuman thinking, Cosgriff (2023) describes the inextricable connection between humans and environments and that attunement with the environment can support sustainable wellbeing of more-than-humans and humans (Cosgriff, 2023). Osgood and Odegard (2022) also propose a reconfiguration of our more-than-human relationships with non-human living organisms by letting go of efficiency and certainty and observing care and attunement, resonating with Kim’s call for “curriculum as in motion” (2023, p. 72).

The suggestions above speak loudly and clearly to the notions of place, Indigenous knowledges and culture and seeking to care for land. In fact, it is difficult to discuss socioecological challenges and affective encounters without speaking of the importance of these. However, this article assumes the importance of Indigenous knowledges and cultures in this space and, instead, briefly touches on them within the vignette, but homes in on affective encounters as one step towards helping teachers construct meaningful learning environments in PE within the constraints of school systems and policy.

Physical education’s contribution in responding to socioecological challenges

Whilst the vignette offers a speculative version of what a PE looks like against a small range of curriculum outcomes when teachers and students lean in and attune with the broader worldly ecologies through affective encounters, it is valuable to reflect on the ground that PE has already made in developing physically literate young people prepared to respond to socioecological challenges. Many of the approaches are not new; however, Baena-Morales and Gonzalez-Villora (2023) suggest they are under-theorised. Many researchers have leant on UNESCO’s Sustainable Development Goals (SDGs) to think through the issues and the work to be done in PE (e.g. Baena-Morales & Gonzalez-Villora, 2023; Froberg & Lundvall, 2022; Merma-Molina et al., 2023; Riley & Proctor, 2022). Merma-Molina et al. (2023) suggest that of the 17 SDG goals and 169 sub-goals, there are 24 sub-goals that PE could take responsibility for, positing PE as a significant space for students to learn about and engage with issues around sustainable development. We must broach these with caution though, as there has been a plentiful critique of the SDGs for the contradiction they present in proposing sustainable development without considering how this might be viable on a planet with limited resources (Kopnina, 2020; Stein et al., 2022).

Examples of programs that engage students relationally with the environment include Friluftsliv (Beery, 2013; Lyngstad & Sæther, 2021), which is a Norwegian approach to PE that engages young people in enjoyable and sustainable physical activity experiences in nature. Research speaks of the opportunities Friluftsliv offers in helping young people develop relationships *with* nature, through nature being “sensed and experienced” (Lyngstad & Saether, 2021, p. 518), in a rich educational opportunity. More recently, Plogging, a Swedish-born activity, has been brought to the fore as an eco-friendly approach to PE that develops participants’ care for the environment by picking up rubbish whilst jogging (Martinez-Mirambell et al., 2023). It has been recognised as fostering community responsibility and developing collective actions that heighten students’ proactivity to strive for change (2023).

These two examples help to reinforce the reconceptualised notion of PL to include an ecological domain of learning which can be developed through embodied and affective encounters in and with nature. Thoughtfully planned and constructed, Friluftsliv and Plogging are activities that can give rise to affective responses through meaningful encounters, which can in turn support greater environmental attunement. Naturally, these activities, set outside of the school boundaries, allow for greater opportunities for environmental attunement, given the necessity for experiences that are “sensory, embodied and emplaced” (Cosgriff, 2023, p. 630). So how might we structure encounters in school PE that capitalise on the embodied and relational nature of the discipline to

provide opportunities for affective encounters for students and that reframe young people as *becoming*, the curriculum as fluid and responsive to the experiences of the students, within physical school structures, and through a posthuman lens?

Conclusion

Although many who lean on traditional ways of doing in PE may not recognise this as PE, this vignette disrupts the first and attempts to bring to life what learning in PE, within the constraints of a school system and space, might look like through a posthuman lens. This provocation envisions PE as a space for developing physically literate learners and being responsible in the world. Through the vignette, students are challenged to reflect; to *be* in and *with* nature relationally through the various assemblages created in the space as learners engage through encounters; to affect and be affected; to pause and attune to interconnected realities; and to work collaboratively to pool knowledge and skills, think critically and solve problems. The teacher has crafted broad learning intentions, using their knowledge of the purpose of the discipline and associated curricular requirements, in keeping with the neoliberal requirements of a school and its policies. But they have constructed a space for learning — not with a didactic intent, but in a manner that opens the students up to a range of interactions — or *leading out*, with the learners determining the direction of the learning. Students come to the space with prior lived and embodied encounters and knowing this way of learning and a personal and social responsibility developed through previous affective encounters that have moved them and that provide them with intent. These are also some of the points of difference between vignette one and vignette two.

In closing, Braidotti's call for thinking, acting and doing differently, through a posthuman lens, is a possible scenario in schools and in PE. We already see examples of this work. To move forward, teachers must hear the call to action and accept the challenge that we all need to take responsibility. In opening themselves up to a state of *becoming*, teachers might, in turn, be able to help students work more meaningfully with the socioecological challenges that confront us all. It has been recognised that PE has a history of resistance to change, often tied to teachers' histories and identities, so it is acknowledged that a shift to using a posthuman lens is confronting and challenging. But just like students, ethico-onto-epistemological shifts that might help teachers reframe education, PE and PL are possible through affective and embodied encounters. Meaningful personal and professional learning experiences might support greater environmental attunement.

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References

- Aartun, I., Walseth, K., Førland Standal, O., & Kirk, D. (2022). Pedagogies of embodiment in physical education – a literature review. *Sport, Education and Society*, 27(1), 1–13. DOI: [10.1080/13573322.2020.1821182](https://doi.org/10.1080/13573322.2020.1821182).
- ACARA. (2022). *Cross-curriculum priorities: Aboriginal and Torres Strait Islander histories and cultures version 9.0*. Cross-curriculum Priorities | V9 Australian Curriculum.
- ACARA. (2024a). *Understanding this learning area: Health and Physical Education*. Health and Physical Education | V9 Australian Curriculum.
- ACARA. (2024b). *Understand this cross-curriculum priority: Sustainability*. Sustainability | V9 Australian Curriculum.
- Azzarito, L., Macdonald, D., Dagkas, S., & Fisette, J. (2017). Revitalizing the physical education social-justice agenda in the global era: Where do we go from here? *Quest*, 69(2), 205–219. DOI: [10.1080/00336297.2016.1176935](https://doi.org/10.1080/00336297.2016.1176935).

- Baena-Morales, S., & González-Villora, S. (2023). Physical education for sustainable development goals: Reflections and comments for contribution in the educational framework. *Sport, Education and Society*, 28(6), 697–713. DOI: [10.1080/13573322.2022.2045483](https://doi.org/10.1080/13573322.2022.2045483).
- Bailey, R., Armour, K., Kirk, D., Jess, M., Pickup, I., & Sandford, R. (2009). The educational benefits claimed for physical education and school sport: An academic review. *Research Papers in Education*, 24(1), 1–27.
- Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Duke University Press.
- Beery, T.H. (2013). Nordic in nature: Friluftsliv and environmental connectedness. *Environmental Education Research*, 19(1), 94–117. DOI: [10.1080/13504622.2012.688799](https://doi.org/10.1080/13504622.2012.688799).
- Biswas Mellamphy, N., & Vangeest, J. (2024). Human, all too human? Anthropocene narratives, posthumanisms, and the problem of “post-anthropocentrism”. *The Anthropocene Review*, 00(0), 1–15.
- Bloom, B.S., Engelhart, M.D., Furst, E.J., Hill, W.H., & Krathwohl, D.R. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook 1: Cognitive domain*. David McKay.
- Börner, S., Kraftl, P., Giatti, L.L. (2021). Blurring the ‘-ism’ in youth climate crisis activism: Everyday agency and practices of marginalized youth in the Brazilian urban periphery. *Children’s Geographies*, 19(3), 275–283. DOI: [10.1080/14733285.2020.1818057](https://doi.org/10.1080/14733285.2020.1818057).
- Braidotti, R. (2019). *Posthuman knowledge*. Polity Press. ProQuest Ebook Central. Available at <http://ebookcentral.proquest.com/lib/deakin/detail.action?docID=5841714>.
- Braidotti, R. (2023). Valedictory lecture: We are rooted but we flow. *Future Humanities*, 1(1), 1–12. <https://doi.org/10.1002/fhu.2.4>.
- Brown, T., & Payne, P. (2009). Conceptualizing the phenomenology of movement in physical education: Implications for pedagogical inquiry and development. *Quest*, 61(4), 418–441.
- Brown, T.D., & Whittle, R.J. (2021). Physical literacy: A sixth proposition in the Australian/Victorian Curriculum: Health and Physical Education? *Curriculum Studies in Health and Physical Education*, 12(2), 180–196. DOI: [10.1080/25742981.2021.1872036](https://doi.org/10.1080/25742981.2021.1872036).
- Carl, J., Abu-Omar, K., Bernard, P., Lohmann, J., White, P., Peters, J., Sahlqvist, S., Ma, J., Duncan, M., Barnett, L.M. (2024). Physical literacy in the context of climate change: Is there a need for further refinement of the concept? *Journal of Physical Activity and Health*, 21(4), 316–319.
- Casey, A., & MacPhail, A. (2018). Adopting a models-based approach to teaching physical education. *Physical Education and Sport Pedagogy*, 23(3), 294–310. DOI: [10.1080/17408989.2018.1429588](https://doi.org/10.1080/17408989.2018.1429588).
- Casey, A., MacPhail, A., Larsson, H., & Quennerstedt, M. (2020). Between hope and happening: Problematizing the M and the P in models-based practice. *Physical Education and Sport Pedagogy*, 26(2), 111–122. <https://doi.org/10.1080/17408989.2020.1789576>.
- Cosgriff, M. (2023). Tuning in: Using photo-talk approaches to explore young people’s everyday relations with local beaches. *Sport, Education and Society*, 28(6), 629–640. DOI: [10.1080/13573322.2023.2170345](https://doi.org/10.1080/13573322.2023.2170345).
- Datta, R. (2024). Relationality in Indigenous climate change education research: A learning journey from Indigenous communities in Bangladesh. *Australian Journal of Environmental Education*, 40(2), 128–142. <https://doi.org/10.1017/ae.2024.13>.
- Deleuze, G. (1988). *Spinoza: Practical Philosophy* (R. Hurley, Trans.). City Light Books.
- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia* (B. Massumi, Trans.). University of Minnesota Press.
- Dunlop, L., Atkinson, L., Stubbs, J.E., & Turkenburgvan Diepen, M. (2021). The role of schools and teachers in nurturing and responding to climate crisis activism. *Children’s Geographies*, 19(3), 291–299. <https://doi.org/10.1080/14733285.2020.1828827>.
- Eiss, A., & Harbeck, M. (1969). *Behavioural objectives in the affective domain*. National Science and Teachers Association.
- Ellis, C., & Adams, T.E. (2014). The purposes, practices, and principles of autoethnographic research. In P. Leavy (Eds.), *The Oxford handbook of qualitative research* (pp. 254–276). Oxford University Press.
- Ellsworth, E. (2005). *Places of learning: Media architecture pedagogy*. Routledge Falmer.
- Froberg, A., & Lundvall, S. (2022). Sustainable development perspectives in physical education teacher education course syllabi: An analysis of learning outcomes. *Sustainability*, 14(10), 5955. DOI: [10.3390/su14105955](https://doi.org/10.3390/su14105955).
- Harrison, N., Bodkin, F., Bodkin-Andrews, G., & Mackinlay, E. (2017). Sensational pedagogies: Learning to be affected by country. *Curriculum Inquiry*, 47(5), 504–519. DOI: [10.1080/03626784.2017.1399257](https://doi.org/10.1080/03626784.2017.1399257).
- Harvey, S., & Pill, S. (2019). Exploring physical education teachers’ everyday understandings’ of physical literacy. *Sport, Education and Society*, 24(8), 841–854.
- Hawkins, A. (2008). Pragmatism, purpose, and play: Struggle for the soul of physical education. *Quest*, 60(3), 345–356. DOI: [10.1080/00336297.2008.10483585](https://doi.org/10.1080/00336297.2008.10483585).
- Holman Jones, S., Adams, T.E., & Ellis, C. (2016). *Handbook of autoethnography*. Routledge.
- Hoque, M.E. (2016). Three domains of learning: Cognitive, affective and psychomotor. *The Journal of EFL Education and Research (JEFLER)*, 2(2), 45–52.
- Ingold, T. (2017). *Anthropology and/as education: Anthropology, art, architecture and design*. Routledge.

- IPCC (2023). Sections. In **Core Writing Team**, Lee, H. and Romero, J. (Eds.), *Climate change 2023: Synthesis report. Contribution of working groups I, II and III to the sixth assessment report of the intergovernmental panel on climate change* (pp. 35–115). IPCC. <https://doi.org/10.59327/IPCC/AR6-9789291691647>,
- James, P.** (2017). Alternative paradigms for sustainability: Decentring the human without becoming posthuman. In K. Malone, S. Truong & T. Gray (Eds.), *Reimagining sustainability in precarious times* (pp. 29–44). Springer. <https://doi.org/10.1037/0000120-016>.
- Johnrose, W., & Maher, A.** (2010). National curriculum physical education: Health lifestyles and lifelong participation in physical activity. *Journal of Qualitative Research in Sports Studies*, 4(1), 15–22.
- Jukes, S., & Riley, K.** (2024). Experiments with a dark pedagogy: Learning from/through temporality, climate change and species extinction (. . . and ghosts). *Australian Journal of Environmental Education*, 40(2), 108–127. DOI: [10.1017/ae.2024.12](https://doi.org/10.1017/ae.2024.12).
- Kara, S.** (2023). Rhizomatic learning for nomadic learners: A postdigital education blended conceptual metaphor framework. In M.S. Khine (Eds.), *Rhizome metaphor: Legacy of Deleuze and Guattari in education and learning* (pp. 111–126). Springer.
- Kim, B.S.** (2023). Curriculum as becoming: Becoming with a forest. In M.S. Khine (Eds.), *Rhizome metaphor: Legacy of Deleuze and Guattari in education and learning* (pp. 71–91). Springer.
- Kirk, D.** (2010). *Physical education futures*. Routledge.
- Kirk, D.** (2020). *Prearity, critical pedagogy and physical education*. Routledge.
- Kokorudz, S.** (2022). (DE)(RE)territorializing re-entry adult learners. *Australian Journal of Environmental Education*, 38(3-4), 251–266.
- Kopnina, H.** (2020). Education for the future? Critical evaluation of education for sustainable development goals. *The Journal of Environmental Education*, 51(4), 280–291. DOI: [10.1080/00958964.2019.1710444](https://doi.org/10.1080/00958964.2019.1710444).
- Law, J., & Singleton, V.** (2013). ANT and politics: Working in and on the world. *Qualitative Sociology*, 36(4), 485–502.
- Lawson, H.** (2009). Paradigms, exemplars and social change. *Sport, Education and Society*, 14(1), 77–100.
- lisahunter, F., H., M., & Allen, J.M.U.** (2024). Honouring Indigenous knowledges: Planetary health (curriculum+) obligations in teacher education, sport education, health education and health and physical education. *Curriculum Studies in Health and Physical Education*, 15(2), 119–137. DOI: [10.1080/25742981.2024.2360014](https://doi.org/10.1080/25742981.2024.2360014).
- Locke, L.F.** (1992). Changing secondary school physical education. *Quest*, 44(3), 361–372. DOI: [10.1080/00336297.1992.10484062](https://doi.org/10.1080/00336297.1992.10484062).
- Lynch, S., Sutherland, S., & Walton-Fisette, J.** (2020). The A-Z of social justice physical education: Part 1. *Journal of Physical Education, Recreation & Dance*, 91(4), 8–13. DOI: [10.1080/07303084.2020.1724500](https://doi.org/10.1080/07303084.2020.1724500).
- Lyngstad, I., & Sæther, E.** (2021). The concept of ‘friluftsliv literacy’ in relation to physical literacy in physical education pedagogies. *Sport, Education and Society*, 26(5), 514–526. DOI: [10.1080/13573322.2020.1762073](https://doi.org/10.1080/13573322.2020.1762073).
- Macdonald, D.** (2002). *Critical pedagogy: What might it look like and why does it matter?*. Routledge.
- Macdonald, D., & Enright, E.** (2013). Physical literacy and the Australian health and physical education curriculum. *ICSSPE Bulletin - Journal of Sport Science and Physical Education*, 65, 352–361.
- Markula, P.** (2008). Affect[ing] bodies: Performative pedagogy of pilates. *International Review of Qualitative Research*, 1(3), 381–408.
- Martínez-Mirambell, C., Boned-Gómez, S., Urrea-Solano, M., & Baena-Morales, S.** (2023). Step by step towards a greener future: The role of plogging in educating tomorrow’s citizens. *Sustainability*, 15(18), 13558. DOI: [10.3390/su151813558](https://doi.org/10.3390/su151813558).
- Massumi, B.** (2002). *Parables for the virtual: Movement, affect, sensation*. Duke University Press.
- Massumi, B.** (2015). *Politics of affect*. John Wiley & Sons.
- Mayes, E., & Holdsworth, R.** (2020). Learning from contemporary student activism: Towards a curriculum of fervent concern and critical hope. *Curriculum Perspectives*, 40(1), 99–103. DOI: [10.1007/s41297-019-00094-0](https://doi.org/10.1007/s41297-019-00094-0).
- Mayes, E., Center, E.** (2022). Learning with student climate strikers’ humour: Towards critical affective climate justice literacies. *Environmental Education Research*, 29(4), 520–538. DOI: [10.1080/13504622.2022.2067322](https://doi.org/10.1080/13504622.2022.2067322).
- McGimpsey, I., Rousell, D., & Howard, F.** (2023). A double bind: Youth activism, climate change, and education. *Educational Review*, 75(1), 1–8. DOI: [10.1080/00131911.2022.2119021](https://doi.org/10.1080/00131911.2022.2119021).
- Merma-Molina, G., Urrea-Solano, M., Gonzalez-Villora, S., & Baena-Morales, S.** (2023). Future physical education teachers’ perceptions of sustainability. *Teaching and Teacher Education*, 132, 1–11. DOI: [10.1016/j.tate.2023.104254](https://doi.org/10.1016/j.tate.2023.104254).
- Metzler, M.W.** (2011). *Instructional models for physical education*. 3rd edition, Oxon.
- Mordal-Moen, K., & Green, K.** (2014). Neither shaking nor stirring: A case study of reflexivity in Norwegian physical education teacher education. *Sport, Education and Society*, 19(4), 415–434.
- Ní Chróinín, D., Coulter, M., & Parker, M.** (2020). We took pictures?: Children’s meaning making in physical education. *Journal of Teaching in Physical Education*, 39(2), 216–226.
- O’Connor, J.** (2019). Exploring a pedagogy for meaning-making in physical education. *European Physical Education Review*, 25(4), 1093–1109.
- O’Connor, J., & Alfrey, L.** (2015). Activating the curriculum: A socio-ecological action research frame for health and physical education. *Sport, Education and Society*, 20(6), 691–709. DOI: [10.1080/13573322.2013.789013](https://doi.org/10.1080/13573322.2013.789013).
- O’Connor, J., Alfrey, L., & Payne, P.** (2012). Beyond games and sports: A socio-ecological approach to physical education. *Sport, Education and Society*, 17(3), 365–380.

- Osgood, J., & Odegard, N. (2022). Crafting granular stories with child-like embodied, affective and sensory encounters that attune to the world's differential becoming. *Australian Journal of Environmental Education* 38:227–241. <https://doi.org/10.1017/ae.2022.11>.
- Peters, J. (2021). *Understanding early-career physical educators' theories of practice amidst curriculum change* [Unpublished doctoral dissertation]. Deakin University.
- Pozo, P., Grao-Cruces, A., & Pérez-Ordás, R. (2018). Teaching personal and social responsibility model-based programmes in physical education: A systematic review. *European Physical Education Review*, 24(1), 56–75. <https://doi.org/10.1177/1356336X16664749>.
- Riley, K., & Proctor, L. (2022). A physical education/environmental education nexus: Transdisciplinary approaches to curriculum for a sense of belonging. *Australian Journal of Environmental Education*, 38, 267–278. <https://doi:10.1017/ae.2021.29>
- Rudd, J.R., Woods, C., Correia, V., Seifort, L., & Davids, K. (2021). An ecological dynamics conceptualisation of physical 'education': Where we have been and where we could go next. *Physical Education and Sport Pedagogy*, 26(3), 293–306. DOI: [10.1080/17408989.2021.1886271](https://doi.org/10.1080/17408989.2021.1886271).
- Shilcutt, J. B., Oliver, K. and Nascimento Luguetti, C. (2024). *An activist approach to physical education and physical activity: Imagining what might be*. Routledge.
- Sport Australia (2020a). Physical literacy. Available at: https://www.sportaus.gov.au/physical_literacy.
- Sport Australia (2020b). Sport Australia position statement on physical literacy. Available at: https://www.sportaus.gov.au/__data/assets/pdf_file/0003/714414/Physical-Literacy-Framework_Postion-statement.pdf.
- Stein, S., Andreotti, V., Susa, R., Ahenakew, C., & Cajkova, T. (2022). From “education for sustainable development” to “education for the end of the world as we know it. *Educational Philosophy and Theory*, 54(3), 274–287. DOI: [10.1080/00131857.2020.1835646](https://doi.org/10.1080/00131857.2020.1835646).
- Stevenson, H. (2017). The “datafication” of teaching: Can teachers speak back to the numbers? *Peabody Journal of Education*, 92(4), 537–557. DOI: [10.1080/0161956X.2017.1349492](https://doi.org/10.1080/0161956X.2017.1349492).
- Strom, K., & Mills, T. (2021). Affirmative ethics and affective scratchings: A diffractive re-view of posthuman knowledge and mapping the affective turn. *Matter: Journal of New Materialist Research*, 3, 200–223.
- Susen, S. (2022). Reflections on the (post-)human condition: Towards new forms of engagement with the world? *Social Epistemology*, 36(1), 63–94. DOI: [10.1080/02691728.2021.1893859](https://doi.org/10.1080/02691728.2021.1893859).
- Svendsen, A.M., & Svendsen, J.T. (2016). Teacher or coach? How logics from the field of sports contribute to the construction of knowledge in physical education teacher education pedagogical discourse through educational texts. *Sport, Education and Society*, 21(5), 796–810.
- Taylor, N., Wright, J., & O'Flynn, G. (2016). HPE teachers' negotiation of environmental health spaces: Discursive positions, embodiment and materialism. *Australian Educational Researcher*, 43(3), 361–376.
- Tinning, R. (2004). Rethinking the preparation of HPE teachers: Ruminations on knowledge, identity and ways of thinking. *Asia-Pacific Journal of Teacher Education*, 32(3), 241–253. DOI: [10.1080/1359866042000295406](https://doi.org/10.1080/1359866042000295406).
- Tovar-Gálvez, J.C. (2022). Interpretation of the reality in environmental education: Identification of mono-, multi-, inter-, trans- disciplinary and inter-epistemic experiences. *Interdisciplinary Journal of Environmental and Science Education*, 18(3), e2274. DOI: [10.21601/ijese/11879](https://doi.org/10.21601/ijese/11879).
- Walseth, K., Engebretsen, B., & Elvebakk, L. (2018). Meaningful experiences in PE for all students: An activist research approach. *Physical Education and Sport Pedagogy*, 23(3), 235–249.
- Welch, R., Taylor, N., & Gard, M. (2021). Environmental attunement in the health and physical education canon: Emplaced connection to embodiment, community and 'nature. *Sport, Education and Society*, 26(4), 349–362. DOI: [10.1080/13573322.2021.1890572](https://doi.org/10.1080/13573322.2021.1890572).
- Whatman, S., Quennerstedt, M., & McLaughlin, J. (2017). Indigenous knowledges as a way to disrupt norms in physical education teacher education. *Asia-Pacific Journal of Health, Sport and Physical Education*, 8(2), 115–131. DOI: [10.1080/18377122.2017.1315950](https://doi.org/10.1080/18377122.2017.1315950).
- White, P.J., Ardoin, N., Eames, C., & Monroe, M.C. (2024). *Agency in the Anthropocene: supporting document to the PISA 2025 science framework*. OECD education working papers, 297. OECD Publishing.
- Young, L., Alfrey, L., & O'Connor, J. (2023). Moving from physical literacy to co-existing physical literacies: What is the problem? *European Physical Education Review*, 29(1), 55–73. DOI: [10.1177/1356336X221112867](https://doi.org/10.1177/1356336X221112867).

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