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RESEARCH/PRACTICE ARTICLE

Learning Cycles: Enriching Ways of Knowing Place

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Abstract

We share a story about a *katitjin bidi*, a learning journey in a bioregion with a multimillennial Aboriginal history. As part of this *katitjin bidi*, three environmental educators implemented a place-based pedagogy called 'becoming family with place', while a fourth participated in the preplanning and final reflective stages. Our story includes cycles of ways of knowing, resulting in an enriched practice of being-with our place. Our story is underpinned by Aboriginal epistemologies to reimagine regenerative futures linked with those of 'the long now' — the past, present and future here now. Ours is a particular story that lives in a particular southwest place. There are layers of meanings that live right across the landscapes in the southwest of Australia — and many of them are hiding in full view. You might like to try this pedagogy in school learning, teacher education, and community education contexts.

Keywords: culture; justice; environmental education; epistemology; methodology; place; ecological spirituality

Introduction

> *We share with our fellow Australians our love for Country, our land and our seas that brings us together and makes our futures inseparable. (Perkins, 2019)*

For Perkins, who delivered the 2019 Boyer Lectures, the hope is to end the silence relating to Aboriginal sovereignty. We endorse her sentiment, and here is our small story of hope.

At the outset,[1] we wish to acknowledge the Noongar and all Indigenous custodians of the lands on which we live and work, and pay our respects to their human and more-than-human knowledge carriers past, present and continuing. By way of personal introduction to our research group, we are a social worker, a scientist, a social scientist and a communications professional, and are connected through the common experience of growing up in Noongar[2] Country, the southwest of Western Australia. Three of our group conducted the empirical research, while the fourth was part of this project at the outset but was overseas during the active phases, so shared in reflecting on the analysis, synthesis and conclusions. We are all environmental educators and university scholar-researchers; two are Noongar language speakers, one being Indigenous to the southwest and three fellow Australians whose ancestors are Indigenous elsewhere.[3] As a result of this study, each of us is now part of a re-emerging *katitjin bidi*, learning journey. We will say more about this shortly.

We set out to explore a pedagogy for learners to encounter place using Aboriginal[4] perspectives (Williams, Bunda, Claxton, & MacKinnon, 2018; Morrison, Rigney, Hattam, & Diplock, 2019, pp. 34–36). Put simply, our intention was to engage more deeply in our home place by recognising

and celebrating 60,000+ years of storied history, because its omission maintains the silence of the status quo (Nakata, 2018). This decision offered us the opportunity to confront the dualisms embedded in our everyday use of English language and to incorporate relational ways of thinking (Williams, 2018). We heeded Indigenous writers such as Styres (2018), who writes, 'We, all of us, must develop a critical discourse that explores the ways colonial relations are and continue to be perpetuated and maintained through relations of power and privilege' (p. 32). We wanted to decolonise our thinking, recognising that our lands have been colonised (Tuck, McKenzie, & McCoy, 2014).

Like other sections of a *katitjin bidi*, learning journey, arising across the southwest landscape (e.g., Stocker, Collard, & Rooney, 2016), our part recognises Aboriginal epistemologies 'as a way to inspire society to reimagine regenerative futures' (Wooltorton, Collard, Horwitz, Poelina, & Palmer, 2019). We wanted the relational worldview and epistemology already explained through Noongar language to enhance our practice and strengthen the pedagogy (Bennell, 1993; Bracknell, 2015, 2017; Wooltorton, Collard, & Horwitz, 2019b).

Our purpose in this article is simply to tell one of our stories, this time about development of a pedagogy. Occasionally we use Noongar language to emphasise the point that the concept does not simply translate into English, because Noongar concepts are relational. Let us consider *katitjin bidi*, learning journey, for instance. *Katitjin* means know or understand, including complex systems. *Bidi* means trail or path, usually beside a river, and includes the travelling experience itself. An extension of bidi is bidier, which means leader who knows the trails through the *karlaboodja*, homeland, and can speak for place. However, it is more than this, because *karl* is both home and fire — the *bidier* decides when the home-place must be fired. In addition, *boodja* means Country, a deep, complex, kin-based, socio-ecological relational system, bound by cultural responsibilities, obligations and rules. All of this means a *katitjin bidi* is more than a simple learning journey. It includes place-based obligations and responsibilities to care. In this way, knowing means commitment to action, to participate, a fully embodied, practical and postconceptual way of understanding and living into one's place.

The pedagogy we call 'becoming family with place' applies the concept of 'becoming family' originally developed by Buchanan, Collard, and Palmer (2019). To refine it, we use a Cooperative Inquiry[5] methodology that uses an extended onto-epistemology (first published by Heron, 1996), the basis of which is as follows:

> *For I give, and so find, meaning in four ways: by meeting reality through immediate encounter [experiential knowing]; by construing it in terms of imaginal patterns [creative or presentational knowing]; by construing it in terms of the concepts that come with language [conceptual or propositional knowing]; and by action in relation to it [post-conceptual or participative knowing]. (Heron, 1996, p. 204)*

In our active research, we participated in seven cycles of exploration using four basic methods.[6] We believe the learning enabled us to come to know our place in an enriched, more fulsome way. Below, we review literature, develop the theory and methodology, and finally, we present our data and discussion of the outcomes.

Literature: Reconnecting people and place

It is well documented that our everyday occidental languages are constrained in their ability to reconnect people and environment (e.g., Abram, 1996; Latour, 2017; Williams, 2018). For example, the fact that there is a word for 'nature' communicates a false message of separation between people and ecosystem; similarly, colonial processes have marginalised and 'othered' Indigenous peoples (Tuck et al., 2014). More recently, related notions such as individualism,

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linear thinking and abstraction have been shown to make learning difficult for everyone (Yunkaporta, 2019).

Indigenous languages tend to explain knowledge systems using pattern thinking, connections and relationships through a relational worldview. These understand human cultures as part of complex ecological systems such that they arise or co-become as self-organising systems. For this reason, Aboriginal epistemologies and ontologies are required for sustainable futures and, in fact, human continuity on Earth (Dodson, 2010; Yunkaporta, 2019).

Natureculture

Generally, Aboriginal languages carry the understanding that place is a natureculture (as described by Whitehouse, 2011), which recognises landscape as comprising systems of human interdependence. Bawaka Country et al. (2019) illustrate this using the concept of co-becoming:

> *For Yolŋu people, Country means homeland. It means home and land, but it means more than that too. It means the seas, and the waters, the rocks and the soils, the animals and winds and all the beings, including people that come into existence there. It means the connections between these things, and their dreams, their emotions, their languages and their Rom (Law). It means the ways we emerge together have always emerged together and will always emerge together (Country et al., 2016). This co-becoming manifests through songspirals, known more commonly as songlines or dreamings. Songspirals are rich and multi-layered articulations, passed down through the generations and sung by Aboriginal peoples in Australia to make and remake the lifegiving connections between people and place. (p. 683)*

Country, from this perspective, is animate, agential and active in the process of co-becoming. People carry responsibilities and obligations, such that response and response-ability are at the heart of co-becoming as Country and 'anchor us in infinite cycles of kinship, sharing and responsibility' (Bawaka Country et al., 2019, p. 684). This is also the case in Noongar Country, where *boodja* is a holistic, agential concept that includes socio-ecological systems (Wooltorton, Collard, & Horwitz, 2017).

In Noongar language, the term *boodja*, Country,[7] refers to ecosystems of which people are implicitly a part. Likewise, *boodjari* means full of life, pregnant. The term *boodjari* is an extension of *boodja*, which means *nourishing terrain*, a term first used by Bird Rose (1996), who noted this particular concept in other Indigenous languages. Therefore, an ethic of care, or love, underpins profoundly empathic human interrelationship with place, trees, animals and each other; *kurduboodja*, love of place.

Noongar Onto-Epistemology

In a relational worldview, to carry meaning, concepts cannot be extracted from their cultural and geographical contexts. For instance, in Noongar language, a concept of 'the long now' — comprising the notions of *kura*, *yeye*, and *burdawan* (past, present, and future) — is necessary to understand related concepts such as *boodja*, Country, and *moort*, family (Harben, Collard, & Stasiuk, 2005; Wheatbelt Natural Resource Management, n.d.). This is because the stories and impacts of the past, including colonisation, remain present in our landscapes, experiences, and in our hearts. Similarly, the future is here as well — in our hands, in our landscapes, and in our children. In this way, *boodja*, Country, is still alive and the spirits are still here, as are the memories, the knowledges, the shadows and the archetypes (Scott, Roberts, Woods, & Roberts, 2011; Wooltorton, Collard, & Horwitz, 2015). When you walk in the bush at dusk in the southwest, you might hear twigs break and a whistle! *Aliwa, look out! It might be a little*

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mischief maker, mamara. Stay near a light or a fire.[8] These stories live in the southwest, they are shared and alive (Bennell, 1993; Mia, 2008). And *katitjin bidi* needs this southwest context, which is place-based, creative, critical, conceptual and meaningful.

Methodology: Cooperative Inquiry

Our methodological aim is to think, practise and learn in ways that re-centre these previously marginalised relational knowledges and voices, including the agency and voice of Country. We acknowledge that colonial structures and relations continue (Styres, 2018), and we are conscious that as academics we participate in those structures and relations by virtue of working in tertiary education, a hierarchical, exclusive system.

In describing Cooperative Inquiry, Heron (1996) proposes four interconnected methods. Each produces different ways of understanding, to construct a more sophisticated, participative way of knowing. These methods are: direct experience; creativity (such as music, art or poetry) to reflect upon the experience; critique or critical conversations about the experience for concept development; and finally, the epitome, the 'know-how' or the knack, the participative knowing that synthesises all of these ways of knowing. One cycle involves each method, the outcome of which is an integrated but initially tentative form of knowing. The idea of the process is to continuously cycle knowledge forms — over and over again. The process is engaging and embodied, enabling the integration of sensual, creative and critical-conceptual knowing for participative, integrated knowing place and its stories.

Data sources, evidence and interpretation

The three active researchers engaged in an extended place-visit to a watershed in the southwest of Western Australia in January 2018. Our process was participative, responsive and practical; we planned activities but were flexible, and we completed some experiential cycles without the reflective cycles in between, returning later to complete them.

Across our three-day excursion, our experiences included the following activities:

- Reading Pascoe's (2014) *Dark Emu* as a common text to consider Aboriginal agriculture;
- Physical and biological water testing at two locations along the river;
- Canoeing on the river;
- Walking to sites, observing elements of built and natural environment and their relationships;
- Visiting the tourist bureau to observe how the town markets itself, its local products and history;
- An 'on Country' visit to explore our individual connections to the landscape, reflect on the possible significance of sites to the land's Aboriginal owners (such as rock formations and scar trees[9]), and observe settler agriculture and land management techniques;
- A dinner with friends to hear their stories of migration, settlement and livelihood;
- A recorded conversation between the three of us to explore our connections to this place and our various relationships to Country and First Nations peoples as fellow Australians.

Collectively, these experiences made up our learning journey towards deeper engagement with our home-place. Our aim has been to think, practise and learn in ways that refocus previously marginalised relational knowledges and ways of knowing, such as the agency and voice of Country. Therefore, we present the data visually and verbally to creatively illustrate the story of how we came to understand our place differently.

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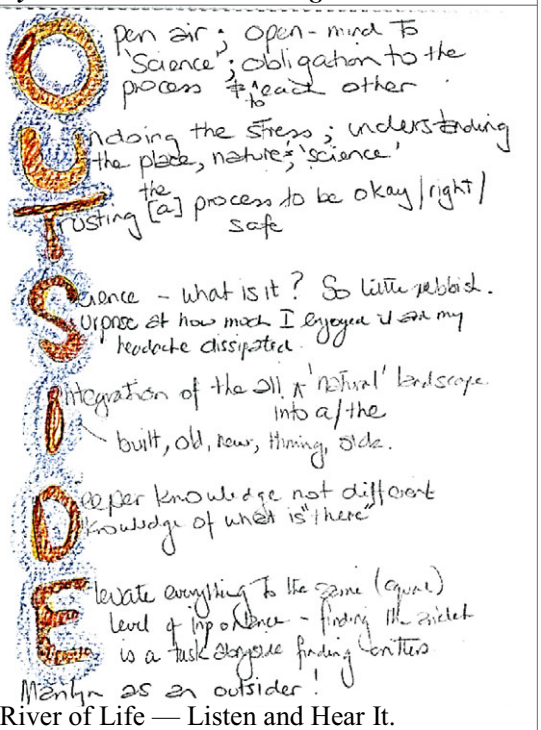
<table>
<tr><th colspan="2">Cycle One: Water testing near the town</th></tr>
<tr><th>Cycle One: Experiential knowing</th><th>Cycle One: Creative knowing</th></tr>
<tr><td> 
Figure 1a. At the water's edge, testing and recording physical water parameters — doing the testing.

 
Figure 1b. At the water's edge, testing and recording biological observations.</td><td> 
River of Life — Listen and Hear It.
Songline, song of life, dance of life — living energy, listen and hear it.
Giver of life ± linking places, stories, beings, listen and hear it.
With ethical time, landscape time.
River's people for 60,000 years — holders of stories, spirits, sciences. Listen, hear.
Figure 1c. Samples of creative reflection.</td></tr>
<tr><th>Cycle One: Conceptual, propositional knowing</th><th>Cycle One: Practical, postconceptual knowing</th></tr>
<tr><td>Site 1: Temperature = 24.2, Salinity = 283 µS, Dissolved oxygen = 5.2 mg/L, soil pH = 6, water pH = 7 Organisms = backswimmers, leaches, mosquito larvae, dragon flies, wasps, dragon fly larvae, snails, stone fly larvae, caddis fly larvae, copepods, red worms, water beetles. A soft breeze, rustling grasses, leaves rubbing — each with different sounds. Birds singing melodiously — butcher birds, magpies, silver eyes, wagtails, occasional rufus whistler.</td><td>Taking time to get to know a placesing tools of our trade (scientific instruments) and observations to determine a river's health. Yet, it is often the case that although we implement the usual tests and conduct the usual observations, we end up with more questions than answers. We are surprised by the indicators and decide to test at another site to determine factors impacting on the river's health. Knowing is coming together, and tenuous. We 'know-how' to conduct water tests, we feel a connection to the river.</td></tr>
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<table>
<tr><th colspan="2">Cycle Two: Water testing at an historic bridge</th></tr>
<tr><th>Cycle Two: Experiential knowing</th><th>Cycle Two: Creative knowing</th></tr>
<tr><td> 
Figure 2a. Seeing the bridge for the first time

 
Figure 2b. Water testing in clear water under the bridge.</td><td>I see time — in tree life, in river life, over generations
Of hills, plains, floods and drought
The long now: past, present and future
Simultaneous — synchronous — sequential.
Why, I wonder?
Denuded landscapes, pained climates;
chaotic, dystrophic systems.
But gifts from river, landscapes, time — for stories, diversity, love — with soul.
Continuous renewal, continuous hope — always opportunity for change.

 
Can we feel the soul of place?
Figure 2c. Creative reflections: spirit of place.</td></tr>
<tr><th>Cycle Two: Conceptual, propositional knowing</th><th>Cycle Two: Practical, postconceptual knowing</th></tr>
<tr><td>Site 2: Temperature = 26, Salinity = 272.3 µS, Dissolved oxygen = 6.1 mg/L, soil pH = 6.7, water pH = 8.5 Organisms = mosquito larvae, dragon flies (2 varieties), caddis fly larvae, fish, gilgie claw, algae (lots).
• The bridge provided us with much needed shade.
• Logs jammed in the underbelly of the bridge, indicating levels of past flooding.
• Two teenage girls cycled to the river to explore; the river here is being acknowledged and appreciated by more than just us.</td><td>Each time we have gone to conduct a macro-invertebrate investigation we have found that the longer you work, the more you find. It takes a bit of time to get your eye in … to begin to see again in the right ways.
An emergent postconceptual knowledge is becoming evident in us as researcher/learners. Incorporating science — and optimistic test results — with history, geography and the creative-spiritual. Which is creative, and which is spiritual, and do we need to know?</td></tr>
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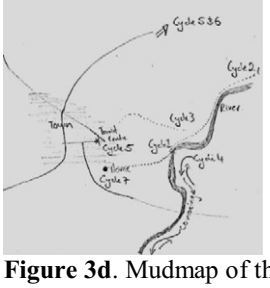
<table>
<tr><th colspan="2">Cycle Three: Walking to and along the river</th></tr>
<tr><th>Cycle Three: Experiential knowing</th><th>Cycle Three: Creative knowing</th></tr>
<tr><td> 
Figure 3a. Gazebo, on walk back from the bridge.

 
Figure 3b. Spontaneous weeding</td><td>Clean Water, denuded landscapes,
Wasted gifts, wasted landscape time.
Economic modernity: ignorance of beauty, ignorance of love, ignorance of soul, ignorance of attraction, ignorance of multispecies' desire. Deep personal pain: A sense of loss.
Who sees, who calls the spirits, who listens?
I do. Sitting in the gazebo, looking in, looking out.

The Joy of Action: Weeding Public Places
I love pulling weeds with friends,
The sense of sharing to make a difference,
Team work shows quick results,
Will anyone know it is weeded?
Will anyone know those thorns are gone?
I know, we know! We share the joy.
Figure 3c. Creative reflections on our walk</td></tr>
<tr><th>Cycle Three: Conceptual, propositional knowing</th><th>Cycle Three: Practical, postconceptual knowing</th></tr>
<tr><td>• Cleared farms, prickles, invasive species, overgrown sitting spaces.
• Hot and dry: too hot for the dog's feet.
• Sunny weather, sunburn.
• Albrecht (2012), solastalgia: 'the lived experience of negative environmental change'.
• The native grasses shown in Pascoe (2014) are absent. We know so little.
• Where would Noongar scientists start an ecological recovery?
 
Figure 3d. Mudmap of the area, illustrating the sites of our 7 cycles.</td><td>We are knowing the place more deeply, becoming more connected — or reconnected — and having a sense of responsibility towards it; developing more wholesome relationships with this place and each other.
Which Noongar plants used to grow here and what needs to happen for them to be replanted?
We are hot and tired at the end of a day in the sun and we were underprepared with not enough food, water and sunscreen.
We need to see the river from another way, not just check on its health; that is a deficit model. If humans bring themselves to near extinction, the river will eventually be fine.
We need to be cool and able to appreciate its aesthetics, its strengths. We decide to hire canoes for tomorrow.</td></tr>
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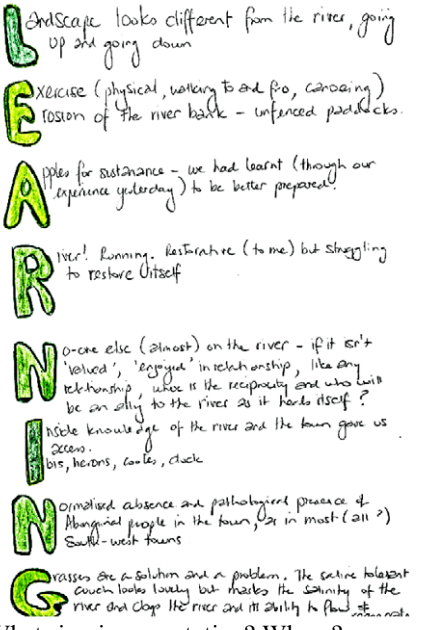
Cycle Four: Canoeing on the river

Cycle Four: Experiential knowing

Figure 4a. Experience on the water, observing, experiencing the place.

Figure 4b. Experience on the water, observing, experiencing the place.

Cycle Four: Creative knowing



What riparian vegetation? Where?
Hills of yellow, dry, barren, stubble.
I silently scream — shouting noiselessly in my own solitude.
While my paddle gently caresses the river.
Insanity. I am part of this.

Figure 4c. Samples of creative reflection of experience on the water.

Cycle Four: Conceptual, propositional knowing

- Barren hills with farms, weak riparian vegetation — cleared to water's edge.
- Non-Australian animals' feet adapted for other countries, damaging thin soil.
- Contradictions: salt-tolerant grasses, solution and overgrowth problem.
- Aboriginal knowledges, histories ignored.
- Few people use river. Is river ignored, undervalued? But overuse is problematic. What about reciprocity with the river?
- Solitude, sacredness, beauty, peaceful.

Cycle Four: Practical, postconceptual knowing

A less tentative knowing is emerging; feels like emergent insight, a holistic/practical, embodied place-knowledge with conceptual elements, hope and pain. Test scores show a healthier river than expected, but observations are discouraging. A sense of deflation and reconnection, a hollow 'coming home'. Embodied knowing integrating senses, concepts, spirit. Three things together: knowledge of relationships; place; and producing knowledge — includes politics and praxis. Gaining knowledge through experience, reflection, collaboration, practice — demands advocacy.

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<table>
<tr><th colspan="2">Cycle Five: Experiences of non-materiality, the past and the present</th></tr>
<tr><th>Cycle Five: Experiential knowing</th><th>Cycle Five: Creative knowing</th></tr>
<tr><td> 
Figure 5a. Old shop, once vibrant; now ghost-like at dusk.
We visited the local tourist bureau which sells a book, The Mystery of the Mayanup Poltergeist, by Helen Hack (2000). This has a special interest for one of us whose father experienced this phenomena in 1957 when stones and other objects fell from the sky into houses and tents without leaving visible entry signs (Hayward, 2009).</td><td>M: Mayanup Stones: wirrinitj boya: warra wirrin. Mystery
A: Aboriginal mischievous spirit: djenak, balyit, mamara.
Y: Yorga manjong: old woman, wanginy bal yeye: ask her now!
A: Ask the bolyada maaman: witch doctor.
N: Ngoornditj: sorrowing.
U: Aliwa: look out!
P: Places can have energy.

The story of the falling stones is not something we are all comfortable with or curious about. But for me it is a link to my late father and I am sad this story was not explored more when he was alive. Now it is helping me to think about the limitations of this thing called science and to think about why I, like many others, allow myself to believe that western scientific explanations are the pinnacle of all forms of knowledge rather than just one form.
Figure 5b. Two reflections on stories of the falling stones.</td></tr>
<tr><th>Cycle Five: Conceptual, propositional knowing</th><th>Cycle Five: Practical, postconceptual knowing</th></tr>
<tr><td>• The Mayanup stones stories have defied scientific explanation despite attempts (Hayward, 2009)).
• Were they angry Aboriginal spirits? The phenomenon brought angst upon Aboriginal residents as well. According to the notes accompanying the film, there was a view that ‘the old spirits got angry and wanted to do something about the destruction of the land through clearing which happened at that time’ (Hayward, 2009).
• On the other hand, compare the experience of the sacred on the river — personal, phenomenological data (Abram, 1996) but not widely accepted as rational/objective. Deep beauty.
• Summary: there are observable phenomena with sensuous, nonmaterial evidence or explanations.
• A sense of deep relationship with place, the sacred. Can the sacred have an angry spirit?
• Must everything be rational? Is that a colonial mentality? Can it be that some phenomena should not be explained?</td><td>Developing knowledge about the sacred, in postconceptual ways. We share the words with each other, but not the phenomenon itself. Does this mean it is real, or not real? On which basis should evidence be shown? How does phenomena of the sacred or the mysterious help our relationships with place? Is place to be feared? Can falling stones knowledge lead to fear-based respect?
And does the experience of the sacred in place lead to a sense of home, a sense of belonging? And is this the sense of love that we want children to develop, so they will develop capacity to care for places? And advocate for its preservation?
Postconceptual knowing about the structure and function of knowledges in relation to nonmaterial phenomena is interdisciplinary and transdisciplinary, requiring integration of science, religion and philosophy. Should we continuously argue for materialistic evidence? (See Sheldrake, 2014).
And is this limitation also a function of everyday practical politics?
As we visited places around the area, we were mindful of some questions which are not amenable to a scientific explanation.</td></tr>
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<table>
<tr><th colspan="2">Cycle Six: An ‘On-Country’ visit to experience embedded, embodied place-stories</th></tr>
<tr><th>Cycle Six: Experiential knowing</th><th>Cycle Six: Creative knowing</th></tr>
<tr><td> 
Figure 6a. ‘On-Country’ experience of home, deep love for place.</td><td>Looking, djinanginy
Djinaniny boodjaak (Watching country)
Moorditj boodja — kurduboodja (Strong country, love of place; heartlands)
Nina bal kurt boodja (Nina she loves that place)
Bal nidja yeye, bal karlaboodja (She’s here now, at her home place)
Nidja jarra boorn, wanginy kura, yeye, boordawan yarn unnit? (This old jarrah tree can tell stories from the past, today and into the future)
Nitja jarra manjang (This jarrah is very old)
wer djinanginy bilya kepa koorliny (and has seen river water running)
Djinanginy ngama, djinanginy ngura (Watching the water hole, watching the well)
Djinanginy boya (Watching the stones,
Djinanginy boonak (Looking at the forest)
Nina bal wirrin nidja boodja yeye nyininy (Nina’s spirit lives here in this Country)
Nina bal wirrin burdawan nidja boodja nyininy (Nina’s spirit will always stay here in this Country)
Nina kura kura kurlangka bal nyininy, katitjiny nitja boodja (Nina has knowledge of this place, having been here since childhood.)
Nitja Nina karlup boodja (This place is Nina’s home)
Kaat nyininy (Staying on this hill)
Bo djinanginy. (Looking out.)

Figure 6b. Creative reflection, ‘On-Country’ experience. Poem was written mainly in Noongar language then translated.</td></tr>
<tr><th>Cycle Six: Conceptual, propositional knowing</th><th>Cycle Six: Practical, postconceptual knowing</th></tr>
<tr><td>• A sense of home — that deep, ongoing sense of familiarity, of comfort with belonging in a place.
• South West’s recent history is colonisation of place and people: massive clearing.
• Noongar people were forced into town camps, reserves and missions for the first 150 years of settlement.
• Parts of the wheat-belt, originally the mallee-belt, are now 90% cleared of native vegetation.
• We discussed the experience of the nature/society separation, and recognised contradictory tendencies between the individual sense of identity that comes with place-belonging, and the economic trajectory of our political system.
• There can be deep guilt feelings about the actions of settler ancestors; dealing with guilt brings tears and pain.</td><td>This cycle began with experience of a deep sense of home, connection with place. Discussions took place of history, science and its role, and personal and political politics in community and society as a whole. In Australia, society and media acknowledge Aboriginal histories and ecological knowledge, but political forces continually prioritise economic values. The same works for scientific reports of ecological values and recommendations in studies of rising wheat-belt salinity, climate change, river health, coral reefs, sustainable cities. We now know these subjects can be painful, or guilt-laden.
Here contradictory knowledges are applied — the impetus of economics versus the psycho-spiritual values and emotional connections to home, and identity. The locus of the problem and solution is multidisciplinary fields. How do we integrate them for ecological outcomes? Can the structure and function of politics bring solutions together? This whole integral ecology is difficult but essential.</td></tr>
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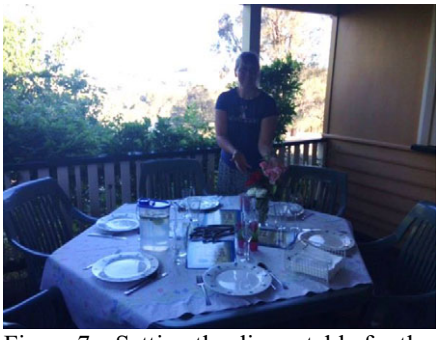
<table>
<tr><th colspan="2">Cycle Seven: The experience of local food, with story telling</th></tr>
<tr><th>Cycle Seven: Experiential knowing</th><th>Cycle Seven: Creative knowing</th></tr>
<tr><td> 
Figure 7a. Setting the dinner table for the experience of sharing stories</td><td>Food for love, food of love, food given in love.
Food made just for us — by person in place.
Food links us, links past, present, future. We all eat from ‘Country’.
Food from the farm: farms for food.
Food is love; place is love.
Food for sustainability — Noongar food cared for landscape, habitat, creatures and people ‘together’.
Food for the future; food from the past.
Food production needs love — love of place, love of landscape, love of each other. In the South West, food production needs Noongar ways of loving place.
Figure 7b. Creative reflection on preparing and eating food with love</td></tr>
<tr><th>Cycle Seven: Conceptual, propositional knowing</th><th>Cycle Seven: Practical, postconceptual knowing</th></tr>
<tr><td>• Booyup Swamp disappeared after a huge flood in 1862 – perhaps at the same time as the Noongar tribesmen, who thereafter are mostly referred to in newspapers for relatively minor misdemeanors.
• After colonisation, there was no land for Noongar agriculture, no place for life. The mill made a long economic contribution to the town, employment, community.
• Multi-generations of growing up in the town; for 200 years and 60,000 years.
• Woollen clothing industry — quality clothes for production, Australian sale. Ethical reason for industry end.
• Economics and politics determine these results — so what is the role and place of science? Where does STEM actually fit?
• Authors linked by love of place, love of each other, wanting to heal South West place-based relationships.</td><td>Practical, postconceptual knowledge is built upon seven cycles of creative and conceptual reflection on multidisciplinary learning experiences. The experiences have been rich, the reflections holistic and meaningful, concepts based upon connected research are integrated, and the postconceptual knowledge and insightfulness is evident. Our knowledge was built upon mainstream and Aboriginal sciences, which built up our knowledge of sciences and how it works, in the process.
STEM, politics, economics — deeply interconnected. How can this be reflected in university and school-based curricula?
Nourishing terrain versus ‘place and community’ presents a deep problem. English does not have an encompassing, integrating concept. (Does it?)
We need to be the generation to change — the transformative generation.</td></tr>
</table>

Discussion — Active research group perspective

For us, the Cooperative Inquiry research methodology enabled an enriched understanding of our place through cycling methods comprising experience, creative reflection, concept development, and practical knowing. The research became the basis for a pedagogy: ‘becoming family with place’. We now understand our place in a more relational way: as storied and agential, with a deep history of human participation, care and love — and a painful recent history. We see that *boodja*, Country, has its own ways that are both mischievous and sacred. It communicates pain as droughts and socio-economic issues trouble its people.

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The minutiae of our sensual experiences — the sounds of water, smells of mud, exhilaration of birds in unanticipated direct eye contact, deep-felt calm — produced in us a gratefulness for the ecosystem in its liveliness. This was accompanied by a deep appreciation of millennia of Noongar generations who cared for and enhanced it through strong relationships of care. The creative activities extended the experiential appreciation in unexpected ways — deepening the experiences and enabling recognition of connections.

Upon these experiences the conceptualisation brought the actions to words and relationships to theory. The postconceptual reflections synthesised and contextualised 'being-with-place in-place'. After multiple cycles, the knowledge of place includes a feeling of care, responsibility — and love. And we realise the learning cycles need to go on and on, on and on.

Generating Knowledge from Ways of Knowing

For us, a cyclical knowledge-generating process was not entirely predictable, particularly as the research was underpinned by genuine participative decision making and had authentic cooperation as its goal (e.g., see Heron, 1996, p. 174). The process was unfolding, irregular and at times tricky, but at the same time often resulted in both confronting emotions and surprisingly profound epiphanies.

Greenwood (2016) describes six paradoxes of place, one of which is:

> *To live more gently and sustainably on the earth and with each other, our places need to be reinhabited, reimagined. Yet, in order to reinhabit places without reinscribing damaging cultural patterns, places also need to be decolonized. Historical wrongs need to be acknowledged, reconciled, healed. This is a thorny paradox. (p. 11)*

For us, the process enabled comprehension of this sometimes unsettling paradox. We acknowledge Harasymchuk (2015, p. 295) in his synthesis of the two constructs of reinhabitation and decolonisation toward a third space of culturally responsive practices, in the social project of confrontation and dislodging of dominant assumptions and systems of thought. A *katitjin bidi* can be a third space for the southwest when underpinned by Noongar concepts (Stocker et al., 2016).

Towards decolonisation

Inspired by shared reading[10] of Pascoe (2014), it is not surprising that many of our conversations pointed to the need for decolonisation, enabling the resurgence of Noongar knowledges and skills. Literature reveals that the current southwest Australian sense of home, the ideal of domestic life including foods, gardens and socio-cultural production, is an English vision first brought with the colonisers (Barnes, Cameron, & Willis, 2010). However, Australia's old, climatically buffered, infertile soils and resulting diversity of native plants show no resemblance to English conditions, resulting in deforestation and habitat destruction, in turn causing species' vulnerabilities and extinctions, acidification and rising salinity levels in soils and groundwater, threatening fragile wetlands and accelerating food insecurity (Hopper, Silveira, & Fiedler, 2016). When the colonisers arrived, local foods were plentiful and reliable but largely invisible to them (e.g., Wollaston, Henn, & Burton, 1948).

This context produced many interesting and painful conversations for us, particularly as most of our excursions visited or passed through farms at the height of summer where difficulties with changing climate and volatile economics were being experienced. Another conundrum arises: Is this about the ethical imperative of ecosystem and cultural revitalisation against a narrative about the significance of farmers producing food for the world? It seems perfectly logical to us that decolonising food security at the same time as our southwest places begins with making Noongar knowledge and natural landscapes 'visible' and deeply respected again. We comprehend

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the political depth and emotional difficulties implicit in this position. It calls into question the ways in which we as Australians 'know' and understand. There are implications for environmental educators here, about knowledge, knowing, and how we come to know it.

Discussion — Full research group perspective

Our project required us to decolonise our thinking. We see in hindsight — reflecting upon our place-based reflections over and over again — that this is to decolonise our mental and emotional landscapes at the same time as our cultural, social, physical and ecological landscapes, which feels to us like an application of a relational worldview. There is much to confront, causing distress and anguish, at the same time as emergence of beauty and comfort.

Decolonisation of the heart

We each have very different experiences with Aboriginal perspectives, in the sense that two of us have lifetimes of experience and speak Noongar language, one being a cultural custodian. In other ways, as a group we are representative of the southwest, in that we also have very diverse political, social and academic backgrounds. This diversity enables our collaboration to function as overlapping mentoring partnerships, with the scientist steering sometimes, the social worker leading where required, and the Noongar speakers contributing as needed. This is a model implemented in other *katitjin bidi* projects (e.g., Wooltorton et al., 2019a). In this particular case, a Noongar cultural custodian was involved in the preplanning and supported the reflective writing process at the end.

Through this process, one of the most frequently repeated words in the data is 'love'. *Kurduboodja*, heartlands or love of place, is underpinned by kin relationships with place. It is described as follows:

> *In this system moort, in the sense of a person's relations, can be animals or plants in a particular place. An example of this is the statement: '"Yongka" [kangaroo] is my uncle and "jarrah" [a species of tree] is my brother', which makes sense through a kinship structure which includes human and more-than-human kindred. This way people are tied to place in a manner that guarantees meaning and familiarity, a connection called: gurduboodjar . . . love of place. This is 'home', in the sense of the English adage 'home is where the heart is'. In Noongar language, it is the place with whom one is related and where one's more-than human relations are established, as they have been since time immemorial. So home-place is also Noongar family which involves the implied familial obligation to care for all these many-species relations including the ground. (Wooltorton et al., 2017, p. 2)*

To be at home in Noongar boodja means to be familiar with place: to be related to place through family.

Spirituality and connection with place

Not surprisingly given the stories in the southwest, spirituality was a strong component of our data. Each of us has experienced the sacred in nature, an ineffable knowledge of animate, living Earth. It can accompany a profoundly peaceful sense of home, warmth — of being cared for at the same time as reciprocally caring. On the other hand, there is an accompanying sense that the sacred needs deep respect — mischievous forces and energies can also be present.

Relational concepts in the environmental humanities are increasingly spiritual/intuitive, such as the Nyikina concept of *liyan* (Poelina & McDuffie, 2018), which translates to *wirrin* in Noongar. This is the place-based intuition linked to knowledge that leads a person through inner knowing,

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and warns them when they need to go a different way. *Wirrin*, in the case of intuition with Country, is a skill of sensuality. There is a long southwest story about *kwop wirrin*, good spirits, and *warra wirrin*, bad spirits (e.g., Collard, Harben, & van den Berg, 2004). This seems to us to be at least partly to do with ways of knowing and how we come to know. In a personal communication about balyits,[11] Palmer (2019) explained that his three decades of being with Aboriginal people has taught him a different, relational way of knowing and understanding. He said: 'There are many more things I could say but yes, the city has plenty of them little things and yes I know where *baalup nyinniny* [they stay]'.

A 60,000-year southwest narrative: Who owns this knowledge?

After much discussion 'on-Country', then with the active research group, and finally in the writing and reflective stages with the full research group, it seems to us there is a conundrum not yet confronted, which is that of knowledge ownership. This will be an ongoing conversation for us, but for the moment this research group understands the context as follows.

There is Noongar cultural knowledge that is restricted to its custodians (Bracknell & Scott, 2019). There is colonial (mainstream) knowledge, which you will find in the history and science books and continuing public conversations. That is shifting, but it seems to us to still be steered by powerful colonial interests (e.g., Kerins & Green, 2019; Perkins, 2019). And there is a third space, katitjin bidi, which synthesises the strengths of both categories towards the emergence of knowledges that reveal the revitalisation of Noongar language, culture, dignity and leadership (Bracknell, 2019; Bracknell & Scott, 2019), and the regeneration and revitalisation of complex ecosystems, life, heart and *kurduboodja*, love of place, in the southwest. We call this *southwest knowledges.*

Southwest knowledges

This knowledge is understood in the southwest, and is available to all — written in books and people's lives and stories, in forests, in species, in the landscapes, on maps and it continues from the dawn of time. In the 'long now', all of these traditions, languages, ecosystems, joys, pain, frustration and massacre sites are still here — hiding in full view. For good and bad, this is who we are in the southwest, and cultural-ecosystem revitalisation offers the opportunity to strengthen this narrative to facilitate regeneration. It is already co-owned. For instance, many Noongar phenomena have been witnessed by fellow Australians, such as the Mayanup stones described in the data (Hayward, 2009), which two of the researcher's families directly experienced.

Similarly, there is a place in the southwest called Mumballup, a Noongar word meaning place of the mamara, little black hairy mischievous fellows who live under the big boya, boulders, at Mumballup, and are noort — they stink! But wait, they are also said to be good judges of character. These fellows continue to make themselves apparent to this day, to passersby irrespective of ancestry, political persuasion or state of mind (Bennell, 1993; Bennell & Thomas, 1981; Mia, 2008).

Finally, there is the realisation that people in the southwest have a substantial Noongar vocabulary even though we may not realise it, as it is part of our floral and faunal nomenclature and our place names. Jarrah, marri, karri, tuart, kwenda, woylie and chuditch and more are common southwest species, and Manjimup, Boyanup, Mumballup, Dardanup and hundreds more are common place names — and these are everyone's business (Collard, Harben, & Rooney, 2015). Katitjin bidi has a long history in the southwest: there is plenty to build upon to renew ourselves, our places and our stories. Everyone in this research team is a member of multigenerational southwest families, and now we recognise that we are each already family with our place. Our new task is to share this place-based Noongar-English knowledge, and sing up that story. It lives here in the southwest, along with the agency of *boodja*, Country, through *wirrin* — spirit, and empowered by

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Noongar language. This is a relational worldview, and we are all in this together. Katitjin bidi means that all of us in the southwest must own and live by our cultural responsibilities.

On local-global knowledges

Broadening the circle of relationships within the 'long now' brings to mind Haraway's (2015) Chthulucene, an emerging epoch that she refers to as 'past, present and to come', which we all need to work towards:

> *Maybe, but only maybe, and only with intense commitment and collaborative work and play with other terrans,*[12] *flourishing for rich multispecies assemblages that include people will be possible. I am calling all this the Chthulucene — past, present, and to come. (2015, p. 160)*

It seems the 'long now' is arising worldwide, along with the idea of becoming family with place. For instance, Haraway (2015) calls for humans to 'make kin' for multispecies ecojustice and to embrace diverse human people. As we see it, this local endeavour has global implications.

Conclusion

> *We cannot live in the past, but the past lives in us. (Attributed to Charles Perkins, in Perkins, 2019)*

This is an interesting way to reflect on place-based Noongar histories, particularly in relation to the Noongar concept of 'the long now'. In finding a way to explore Noongar perspectives on place, we were surprised to find the pedagogy for 'becoming family with place' was capable of producing substantial emotional engagement, requiring skilful, intentional collaboration between us as learners and across our varied disciplinary knowledges. The pedagogy for improving place-based relationship requires empathy and emotional honesty as the basis of social skills for collaboration, as part of the experiential, creative, critical and post-conceptual ways of knowing, being and doing. Our pedagogical practice produced conundrums for us with potential to produce emotions such as hope and hopelessness, empowerment and disempowerment, necessitating skills in conflict resolution and in discipline integration. We acknowledged the deeply politically embedded nature of the sciences, and of worldviews themselves. *And by the way, how do you know what you think you know? Do you really only 'think' it? On what basis can you claim it to be true?*

The grappling implicit in the process enabled us to accept that conundrums exist and are part of the southwest story. They live in us too, along with millennia of Noongar culture, language-embedded stories and very recently, colonisation of people and place. We now understand we are already family with place. Parts of this story need talking up, and perhaps this article will be the first of our continuing efforts to do this, to re-incorporate people, language, narratives and voices silenced by continuing colonial power.

We invite you to incorporate this pedagogy into preservice teacher education programs and other university courses, as well as primary and secondary schools, to facilitate conceptual change and insight about interconnectedness. *We invite you go to a place near you, and listen to its story. It is there in the landscape, hiding in full view. Aliwa! Look out!*

Endnotes

1. Many thanks to the reviewers who helped polish this article to enable us to say what we wanted to say.

2. The first people of the southwest are of the Noongar nation, and speak various dialects of Noongar language. In recognition of this, we refer to the whole South West as Noongar Country. We pay our respects to Noongar custodians past and present for

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their care of 'Boodja' – Country – since the dawn of time. We acknowledge Noongar cultural, scientific and linguistic knowledge which is essential to regenerative futures in our now-shared home land.

3. Thanks to Williams, Bunda, Claxton, and MacKinnon (2018) for digging underneath the Indigenous/non-Indigenous binary.

4. Being Western Australian we use the term 'Aboriginal', which in this paper refers to all Australian First-Nations people. Where the reference is to global or interstate peoples or persons, the term 'Indigenous' is used.

5. Usage of capitals for Cooperative Inquiry denotes reference to the form developed by Heron (1996).

6. We have referred to Heron's 'forms of knowing' as 'methods' for acquiring knowledge about ways of knowing.

7. Country, in Aboriginal contexts, is often capitalised in recognition that it is living, animate, agential.

8. In a few places in this story, sentences in italics communicate a different, possibly cheeky voice: an increasingly common, shared southwest knowledge.

9. Scar trees are discernible across the South West, 'scarred' by Noongar activities such as carving out wood for containers, and then used by Noongar travellers as sign posts.

10. Why *Dark Emu*? (Pascoe, 2014). We chose *Dark Emu* because we felt it was a good place for ourselves (and therefore other educators) to be introduced to a mainstream counter-narrative. It also has an accompanying children's book and units of work to support classroom planning.

11. *Balyits* are small characters with cheeky, magical powers. Many Noongar people, along with an unknown number of fellow Australians, have experienced them.

12. *Terrans* are earth inhabitants, a science fiction term.

References

Abram, D. (1996). *The spell of the sensuous: Perception and language in a more-than-human world*. New York: Pantheon Books.

Albrecht, G. (2012). The age of solastalgia. *The Conversation*. https://theconversation.com/the-age-of-solastalgia-8337.

Barnes, P., Cameron, J., & Willis, H. (2010). *The Australind journals of Marshall Waller Clifton 1840–1861*. Victoria Park, Australia: Hesperian Press.

Country, B., Suchet-Pearson, S., Wright, S., Lloyd, K., Tofa, M., Sweeney, J., ... **Maymuru, D.** (2019). Goŋ Gurtha: Enacting response-abilities as situated co-becoming. *Environment and Planning: Society and Space*, *37*, 682–702.

Bennell, T. (1993). *Kura*. Bunbury, Australia: Kurangkurl Consultancy.

Bennell, E., & Thomas, A. (1981). *Aboriginal legends from the Bibulmun tribe*. Perth, Australia: Rigby Publishers.

Bird Rose, D. (1996). *Nourishing terrains: Australian Aboriginal views of landscape and wilderness*. Canberra, Australia: Australian Heritage Commission.

Bracknell, C. (2015). Kooral dwonk-katitjiny (listening to the past): Aboriginal language, songs and history in south-western Australia. *Aboriginal History Journal*, *38*, 1–18.

Bracknell, C. (2017). Conceptualizing Noongar song. *Yearbook for Traditional Music*, *49*, 92–113.

Bracknell, C. (2019). Connecting Indigenous song archives to kin, country and language. *Journal of Colonialism and Colonial History*, *20*, 1–26.

Bracknell, C., & Scott, K. (2019). Ever-widening circles: consolidating and enhancing Wirlomin Noongar archival material in the community. In L. Barwick, J. Green, & P. Vaarzon-Morel (Eds.), *Language documentation & conservation special publication No. 18 Archival returns: Central Australia and beyond* (pp. 325–338). Honolulu, HI: University of Hawaii Press.

Buchanan, J., Collard, L., & Palmer, D. (2019). Koorliny birniny, ni, quoppa katatjin: Respect and ethics in working with Indigenous Australian communities. In P. Westoby & S. Banks (Eds.), *Ethics, equity and community development* (pp. 123–143). Bristol, UK: The Policy Press.

Collard, L., Harben, S., & Rooney, A. (2015). *Boodjar: Nyungar placenames in the South-West of Western Australia*. http://www.boodjar.sis.uwa.edu.au/index.htm

Collard, L., Harben, S., & van den Berg, R. (2004). *Nitja beeliar boodjar noonookurt nyininy: A Nyungar interpretive history of the use of boodjar (country) in the vicinity of Murdoch University*. https://researchrepository.murdoch.edu.au/id/eprint/21353/1/Nidja_Beeliar_Boodjar_Noonookurt_Nyininy.pdf

Dodson, P. (2010, November 15). Constitutional recognition for Indigenous Australians is not just symbolic. *Sydney Morning Herald*. https://www.smh.com.au/politics/federal/genuine-attempt-to-write-first-peoples-into-nations-contract-20101114-17sm8.html

Greenwood, D.A. (2016). Creative tensions in place-conscious learning: A triptych. *Journal of the Canadian Association for Curriculum Studies*, *13*, 10–19.

Hayward, K. (2009). *Spirit stones*. Perth, Australia: ABC TV. http://www.spiritstones.com.au/spiritstones.com.au/home.html

Haraway, D. (2015). Anthropocene, capitalocene, plantationocene, chthulucene: Making kin. *Environmental Humanities*, *6*, 159–165.

https://doi.org/10.1017/aee.2020.15 Published online by Cambridge University Press

Harasymchuk, B. (2015). *Place-based education and critical pedagogies of place: Teachers challenging the neocolonizing processes of the New Zealand and Canadian schooling systems* [Unpublished doctoral thesis]. University of Canterbury, New Zealand. https://ir.canterbury.ac.nz/bitstream/handle/10092/10662/ThesisJuly202015.pdf;sequence=1

Harben, S., Collard, L., & Stasiuk, G. (2005). *Our country, our stories, our people: Recording traditional knowledge*. https://www.wheatbeltnrm.org.au/sites/default/files/knowledge_hub/documents/RTKlitweb_0.pdf

Heron, J. (1996). *Co-operative inquiry: Research into the human condition*. London: Sage

Hopper, S.D., Silveira, F.A.O., & Fiedler, P. (2016). Biodiversity hotspots and Ocbil theory. *Plant and Soil*, *403*, 167–216.

Kerins, S., & Green, J. (2019). 'Like a rusty nail, you can never hold us blackfellas down': Cultural resilience in the Southwest Gulf of Carpentaria. In J. Russell-Smith, G. James, H. Pedersen, & K.K. Sangha (Eds.), *Sustainable land sector development in Northern Australia: Indigenous Rights, aspirations, and cultural responsibilities* (pp. 177–202). Boca Raton, FL: CRC Press.

Latour, B. (2017). *Facing Gaia: Eight lectures on the new climatic regime*. Cambridge, UK: Polity Press.

Mia, T. (2008). Kepwaamwinberkup (Nightwell). In S. Morgan, T. Mia, & B. Kwaymullina (Eds.), *Heartsick for country*. Fremantle, Australia: Fremantle Arts Centre Press.

Morrison, A., Rigney, L.-I., Hattam, R., & Diplock, A. (2019). *Toward an Australian culturally responsive pedagogy: A narrative review of the literature*. Adelaide, Australia: University of South Australia.

Nakata, M. (2018). Difficult dialogues in the South: Questions about practice. *The AustralianJournal of Indigenous Education*, *47*, 1–7.

Palmer, D. (2019). [Balyits]. Personal communication on 20/11/19 with Wooltorton, S. and Collard, L.

Pascoe, B. (2014). *Dark emu. Black seeds: Agriculture or accident?* Broome, Australia: Magabala Books.

Perkins, R. [Writer] & F. Kelly [Director]. (2019). The end of silence: The genesis of the Uluru Statement. *The ABC Boyer Lectures*. Australian Broadcasting Corporation.

Poelina, A., & McDuffie, M. (2018). Nyikina collaborative filmmaking in the Kimberley: 'Learning to listen with your eyes, and see with your ears'. In P. Morrissey & C. Healy (Eds.), *Reading the Country: 30 years on*. Sydney: University of Technology, Sydney.

Scott, K., Roberts, L., Woods, G., & Roberts, A. (2011). *Noongar Mambara Bakitj*. Crawley, Western Australia; Wirlomin Noongar Language Stories Project; UWA Publishing.

Stocker, L., Collard, L., & Rooney, A. (2016). Aboriginal world views and colonisation: Implications for coastal sustainability. *Local Environment*, *21*, 844–865.

Styres, S. (2018). Literacies of land: Decolonising narratives, storying and literature. In L. Tuhiwai Smith, E. Tuck, & K.W. Yang (Eds.), *Indigenous and decolonising studies in education: Mapping the long view* (pp. 24–37). Routledge.

Tuck, E., McKenzie, M., & McCoy, K. (2014). Land education: Indigenous, post-colonial, and decolonizing perspectives on place and environmental education research. *Environmental Education Research*, *20*, 1–23.

Wheatbelt Natural Resource Management. (n.d.). *Nyungar budjara wangany: Nyungar NRM wordlist and language collection booklet of the Avon Catchment Region*. Northam, Australia: Author.

Whitehouse, H. (2011). Talking up Country: Language, natureculture and interculture in Australian environmental education research. *Australian Journal of Environmental Education*, *27*, 295–302.

Williams, L. (2018). Transformative sustainability education and empowerment practice on Indigenous lands: Part one. *Journal of Transformative Education*, *16*, 344–364.

Williams, L., Bunda, T., Claxton, N., & MacKinnon, I. (2018). A global de-colonial praxis of sustainability — Undoing epistemic violences between Indigenous peoples and those no longer indigenous to place. *The Australian Journal of Indigenous Education*, *47*, 41–53.

Wollaston, J.R., Henn, P.U., & Burton, A. (1948). *Wollaston's Picton journal (1841–1844): Being volume 1 of the journals and diaries (1841–1856) of John Ramsden Wollaston*. Perth, Australia: Paterson Brokensha.

Wooltorton, S., Collard, L., & Horwitz, P. (2015). Stories want to be told: Elaap Karlaboodjar. *PAN: Philosophy, Activism, Nature*, *11*, 3–18.

Wooltorton, S., Collard, L., & Horwitz, P. (2017). The land still speaks. Ni, katitj! *PAN: Philosophy, Activism, Nature*, 2–15.

Wooltorton, S., Collard, L., & Horwitz, P. (2019a). Layers of meanings in our landscapes: Hiding in full view. In M. Ellis (Ed.), *Critical global semiotics: Understanding sustainable transformational citizenship*. London: Routledge, Taylor & Francis.

Wooltorton, S., Collard, L., & Horwitz, P. (2019b). Living water: groundwater and wetlands in Gnangara, Noongar boodja. *PAN: Philosophy, Activism, Nature*, (14), 5–23. http://panjournal.net/.

Wooltorton, S., Collard, L., Horwitz, P., Poelina, A., & Palmer, D. (2019). *A place-based methodology for becoming family*. Manuscript submitted for publication.

Yunkaporta, T. (2019). *Sand talk: How Indigenous thinking can save the world*. Melbourne, Australia: Text Publishing.

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