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Promoting First Nations science capital: reimagining a more inclusive curriculum

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ABSTRACT

This article offers a critical examination of First Nations[1] perspectives in the newly revised Australian Science Curriculum. Despite recent revisions, our analysis indicates that the curriculum continues to marginalise and overlook the rich scientific contributions of First Nations communities in Australia. We employ a science capital lens to probe the design of the curriculum. While the curriculum incorporates elaborations related to First Nations contexts, they are offered to educators as optional, or only intended to be embedded through content descriptions as a cross-curriculum priority. Our research proposes the possibility of a transformative curriculum, one that better acknowledges and embeds First Nations science capital. Emphasising the need for local relevance, this approach advocates for co-constructing learning experiences with First Nations communities and repositioning First Nations perspectives in the curriculum. The study explores the dynamics of collaborating with First Nations stakeholders in curriculum design, highlighting how such partnerships can enrich the exchange of science capital and contribute to a more holistic science education. This integration is crucial for preparing all students to navigate and contribute to the increasingly diverse and multicultural dimensions of society-which include different perspectives of science and science capital, and ultimately promotes a more inclusive science education.

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Introduction

First Nations Australians are recognised as the oldest continuous cultures in the world. To clarify for the global audience who will read this, the First Nations people of Australia are sometimes also referred to as Indigenous Australians, Aborigines, and/or Torres Strait Islanders. They have a unique scientific perspective rooted in thousands of years of observation and understanding. First Nations Australians' ancestries stretch back approximately 75,000 years (Rasmussen et al., 2011), which makes them some of the world's oldest scientists. For millennia, First Nations people have cultivated extensive

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knowledge of weather patterns, environmental stewardship and sustainability, medicine, and astronomy (Pascoe, 2019). First Nations science encompasses science-related knowledge and perspectives that have been developed by Australia's First Nations peoples through their deep connections with their environments over thousands of years (Ens et al., 2015). Such knowledge is deeply embedded in specific environments. The localised nature of these knowledge systems gives rise to a variety of regional practices. Underlying these varied knowledge systems are principles that have broader applicability across regions. For instance, foundational practices such as observation, prediction, testing, along with a deep commitment to sustainability, share a broader resonance with First Nations communities across Australia, highlighting a rich, collective wisdom (Pascoe, 2019). Moreover, Dreaming, deeply connected to time, place, and Country,[2] as well as to every living and non-living entity within both human and more-than-human worlds, is an integral part of First Nations perspectives (Gammage & Pascoe, 2021; Hume, 2000). Dreaming is complex and multidimensional; it gets lost in translation when writing in English. Central to Dreamings are relationships and relationality (Tynan, 2021). As Wilson (2016) notes, First Nations identity is deeply rooted in these relationships. Relationality extends to all aspects of existence as part of Dreaming, with stories and storytelling valued methods of knowledge sharing and learning (Hunt, 2014). Consequently, the unique characteristics of First Nations science include its holistic, interconnectedness with the environment, and representations of science through storytelling – oral history, songs, visuals, and movement (Cooper, Fricker, et al., 2022). In summary, First Nations science consists of locally-adapted knowledge forged from deep environmental connections, combined with understanding and application of broader scientific principles alongside ontological and epistemic beliefs about relationality, relationships and storytelling. This illustrates the coexistence of localised science knowledge with more expansive viewpoints that broadly align across First Nations countries.

Although the Australian Science Curriculum has recently released a major update – Version 9 (V9) – as we will discuss, a notable oversight persists from earlier versions in its failure to adequately embed First Nations perspectives in its design. This oversight represents not just a gap in the cultural inclusiveness of the curriculum, but also a missed opportunity to broaden the scope of science understanding for all students. In this article we argue that First Nations science is a distinct and valuable form of science capital that **all** students should engage with. Increasingly, there is an interest in the use of different capitals to understand students' trajectories in science (e.g. Cooper & Berry, 2020; Cooper, Thomas, et al., 2022; Du & Wong, 2019). We also delve into the concept of science capital and explore its relevance and application in this research. Considering the recent changes in the curriculum, along with the enduring national conversation about reconciliation in Australia – further driven by the 2023 Voice to Parliament referendum result – this study is both timely and significant. This study may also appeal to an international audience engaged in discussions about the marginalisation of non-Western perspectives in science curricula, and the potential opportunities in re-envisioning science education to be more culturally responsive.

We know from previous research that incorporating culturally responsive approaches in science to bolster students' interest and achievement has shown positive results (e.g. Aikenhead, 1996; Emdin, 2010; Essex, 2016; Mackenzie, 2021; Tovar-Gálvez, 2021, 2023; Yoon et al., 2016). Most of these studies assume that learning science involves students entering

a new culture – likened to border crossing (Aikenhead, 1996). This transition sometimes poses challenges for non-Western students given the predominant Western focus of science content. Acknowledging and valuing the science perspectives of First Nations people highlights the need for a curriculum that is culturally responsive. Commonly, the science classroom is viewed as hostile and unwelcoming (Archer et al., 2013). It is a space where many students feel they don't belong. As Gough (2011) argued with respect to the taught science curriculum, given the high level of disengagement many students have with Western science, we have 'an ideal opportunity to delve into the socially constructed nature of science, rather than assuming that science is acultural and objective' (p.84). In this article our emphasis is on curriculum design. In particular, we advocate for a deeper engagement in the curriculum with the scientific viewpoints of First Nations people, alongside Western scientific perspectives. A more culturally responsive curriculum is an important step towards reconciliation. By integrating First Nations perspectives and better acknowledging the cultural dimensions of science, our hope is a curriculum that not only reflects a broader diversity of scientific perspectives but also helps engage students from all backgrounds in more meaningful and culturally sensitive ways.

Beyond a universal science education

Whether science, and thereby science education, is a universal or culturally specific endeavour has long been debated. In the 1980s feminist science philosophers such as Carolyn Merchant (1980), Sandra Harding (1986, 1993) and Donna Haraway (1989) drew attention to the universalist claims of science being conceived of as neutral, objective, value free, non-political, acultural, and unbiased. As Harding (1993) argues, 'non-Western science traditions need to be evaluated in more objective ways, and that the Western traditions need to be more objectively situated in world history' (p.8). More recently, science educators have also come to recognise that it is important to consider the social and cultural values that shape scientific knowledge rather than seeing such knowledge as universal (see, for example, Aikenhead, 2006; Carter, 2006; Dagher & Erduran, 2016; Gough, 1998; Hansson, 2018; Yacoubian, 2020). It is therefore crucial to acknowledge the racist, gendered, and classist agendas that have steered Western science. As Lyn Carter (2006) argues:

> Questions about the ways in which science should be conceptualised and represented by science education not only invite debate about the complex issues of multiculturalism and diversity, and the epistemological parity between Western science and other non-Western sciences, but also promote reflection on moral and value imperatives, as well as our visions for the future (p.678)

Thus, for us, disentangling science education from its Western-centric, racist, gender-biased, and classist underpinnings is imperative for nurturing a more inclusive discourse. By re-situating Western traditions within a broader global context, we pave the way for a more holistic, equitable, and enriching science education that honours a multiplicity of perspectives and fosters a deeper, more nuanced understanding of inquiry that better values different science perspectives.

The design of the curriculum plays a crucial role in either facilitating or hindering a more inclusive approach to science education. It is important to promote more critical

thinking about the nature of science in both curriculum and pedagogy, which will support students to better understand how cultural, historical, and social contexts shape scientific knowledge (Yacoubian, 2020). By focusing on the role of culture in science, educators can begin to dismantle assumptions that have long underpinned science education, and the design of science curricula. This involves not only acknowledging the contributions and perspectives of non-Western science traditions but also understanding and questioning how Western scientific paradigms have historically marginalised other ways of knowing. This positioning is not evident in the Australian Science curriculum, as we discuss in the next section where we examine the design and rooted perspectives underpinning the Australian Science curriculum.[3]

The Australian curriculum: science

As a brief overview for international readers, Australian states and territories have held constitutional responsibility for education since federation in 1901, along with autonomy over their respective education agendas. However, in 1963, the Commonwealth initiated funding for school education, which brought with it more interest in national collaboration (Ross, 2021). While Queensland, Tasmania, South Australia, the Northern Territory, and the Australian Capital Territory (ACT) use the national curriculum as is, Victoria, New South Wales, and Western Australia implement an intermediary syllabus with minor differences from the Australian Curriculum (Ross, 2021). The Australian Curriculum, Assessment and Reporting Authority (ACARA) is the organisation that is responsible for designing the science curriculum. On the ACARA (2023a) website, in its rationale for the design of the curriculum, it states that.

> science is a dynamic, collaborative and creative human endeavour arising from our desire to make sense of our world. Through science, we explore the unknown, investigate universal phenomena, make predictions and solve problems. Science gives us an empirical way of answering curious and important questions about the changing world we live in. Science knowledge is revised, refined and extended as new evidence arises and has proven to be a reliable basis for action in our personal, social and economic lives (para.2).

In the most recent version at the time of writing, the Australian Curriculum: Science V9 consists of three interconnected strands – (1) Science understanding, (2) Science inquiry, and (3) Science as a human endeavour – all of which are comprised of content descriptions (ACARA, 2023a). The *Science understanding* strand focuses on key concepts across four science domains: biology, chemistry, physics, and Earth/space sciences (ACARA, 2023a). The *Science inquiry* strand describes the type of skills that students should ideally develop when conducting scientific investigations, such as questioning, predicting, evaluating, and communicating (ACARA, 2023a). Lastly, the *Science as a human endeavour* strand aims to delve into nature and development of science. In this element of the curriculum (ACARA, 2023a),

> students develop an appreciation of the unique nature of science and scientific knowledge, including that scientific knowledge is based on empirical evidence and can be modified in light of new or reinterpreted evidence. They explore historical and global contributions

> to scientific knowledge and appreciate that individual and collaborative scientific endeavours are influenced by cultural perspectives and world views (para.12).

Later in the rationale for its design, ACARA (2023a) states that,

> The Australian Curriculum: Science enables students to develop an understanding of important science concepts and processes, the practices used to develop scientific knowledge, science's contribution to our culture and society, and its uses in our lives. It supports students to develop the scientific knowledge, understandings and skills needed to make informed decisions about local, national and global issues, and to succeed in science-related careers (para. 3).

The curriculum, however, frames the contribution of science to Australian society largely through a Eurocentric lens, and mostly overlooks the contributions of other scientific communities, notably in the context of this discussion, the First Nations people. This framing not only limits student understanding but also fails to acknowledge the valuable scientific perspectives that have emerged from non-Western science. Rather than embedding First Nations perspectives more prominently within the content descriptions, they are placed in content elaborations. According to the ACARA (2023b) website … 'content elaborations (often referred to as elaborations) provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are **optional**' (emphasis in original) (para.3). This curriculum design is problematic, especially considering that many Australian educators avoid First Nations themes and perspectives into their teaching (Baynes, 2015; Quince, 2012; Yunkaporta & McGinty, 2009).

Cross-curriculum priorities are integrated into each subject area. These include (1) *Asia and Australia's engagement with Asia*, (2) *Sustainability*, and (3) *Aboriginal and Torres Strait Islander histories and culture*. Even though the science curriculum features elaborations and cross-curriculum priorities that incorporate First Nations perspectives, they are offered to educators as optional, or only intended to be embedded through content descriptions. We argue that the current curriculum fails to genuinely integrate First Nations perspectives as a prominent element in its design. Such superficial engagement with First Nations perspectives fails to fully embrace the rich knowledge systems that exist beyond a Eurocentric paradigm. This backdrop forms the context for our study, as we investigate the potential of a more inclusive science curriculum, through the lens of science capital, to investigate the following research questions:

1. How does a science capital lens frame the design of the Australian Science Curriculum and its inclusion of First Nations knowledge, perspectives, and voice?
2. How might a reimagined science curriculum enhance the place of First Nations perspectives in the syllabus?

The remainder of this article is divided into three main sections. First, the methodology describes the science capital lens adopted and the methods used in this research. Second, we present the results and implications of our findings by answering our two research questions. Last, we conclude with a summary of the research insights, implications for stakeholders and possible future research directions. Before moving forward, it is important to clarify the cultural background of the research team, which

provides insight into their ability and capacity to narrate the First Nations themes we explore in this study. Grant is from an Anglo-Saxon background, and one of his research interests is equity-related challenges in STEM education. Al is a proud and sovereign Dja Dja Wurrung man and is a devoted researcher exploring ways to decolonise education in Australia. Annette is a science and environmental education researcher of Anglo-Saxon ancestry who focuses on equity issues in these fields to give opportunities for marginalised voices to be heard.

Methodology

In this critical content review, we used inductive analysis to understand the ideologies, biases, and power dynamics (Thomas & Dyches, 2019) inherent in the design of (1) content descriptions in the Australian Science Curriculum V9, (2) elaborations, and (3) cross-curriculum priorities. In this research, we employed a content analysis technique that began with a systematic keyword search within the curriculum. This initial step involved locating the term 'First Nations' keyword in the curriculum. Once each mention was noted, we embarked on an in-depth examination of the curriculum. Our objective was to examine the curriculum's content for any connections to First Nations science perspectives and importantly, where these connections were integrated into the curricula. This entailed a detailed, line-by-line examination of the curriculum documents where the First Nations term was written, along with a more comprehensive, broader analysis of content descriptions, elaborations, cross-curriculum priorities, and the description of the science curriculum by ACARA on its website (e.g. text in the *Understand this learning area*). We explored instances where First Nations science perspectives might be implicitly integrated into the curriculum as well. This included examining examples, and activities proposed in the curriculum to see if they incorporated or were inspired by First Nations knowledge systems and practices.

In our study, we build upon the concepts introduced by Bourdieu (1984) and further developed by Archer et al. (2015) to explore science capital, encompassing cultural, social, and economic capitals. These capitals play a crucial role in shaping the power dynamics within the science curriculum and learning environments (Archer et al., 2013). Science capital encompasses various elements, including science-related knowledge (*what students know*), attitudes (*what students believe*), experiences (*what students do*), and social contacts (*who students know*) (Godec et al., 2017). These forms of capital have the potential to generate value for individuals or groups, supporting and enhancing their engagement, participation, and achievement in science (Archer et al., 2013). In the context of this article, we expand upon the concept of science capital to specifically examine a distinct type of First Nations science capital. First Nations science capital is conceptualised here as science-related knowledge, practices, and beliefs that are employed by Australian First Nations communities.

First Nations science capital includes various forms of cultural and social capital related to science, such as knowledge of bush medicine, astronomy, and sustainability. It also encompasses culturally unique ways of understanding and engaging with the natural world, along with a range of science-related skills and knowledge transmitted across generations within First Nations communities. When considering the curriculum from a capital lens, the design of the curriculum benefits students with valued types of

science capital. For instance, systemic barriers within STEM disciplines marginalise those who do not fit the idealised student profile-typically white, male, and middle-class in Western contexts, creating an unwelcoming environment for those outside these norms (Godec et al., 2024). We know there is an uneven distribution of valued science capital in the community-underrepresented groups in science, such as First Nations students, generally have less access to these valued forms (Archer et al., 2013; Cooper & Berry, 2020). Students bring science capital to the classroom that is underappreciated, or not leveraged effectively for engagement and learning in science. Curriculum design is crucial in either recognising or overlooking the First Nations science capital students bring to the classroom. Hence, we assessed the representation and value attributed to First Nations ways of knowing: an appreciation of diverse scientific knowledge and perspectives in our analysis of the curriculum. This leads us to Research Question 1.

Research Q1: how does a science capital lens frame the design of the Australian Science curriculum and its inclusion of First Nations knowledge, perspectives, and voice?

Keyword search

V9 of the curriculum saw a shift in terminology from 'Aboriginal and Torres Strait Islander' to 'First Nations'. The latest version contains 111 specific mentions of 'First Nations'. Our analysis did not identify any mention of First Nations outside of elaborations. As mentioned previously, ACARA's instructions to educators are that elaborations are optional. This raises concerns about the expectations placed on educators to teach First Nations perspectives in science. We contend that the current design of the science curriculum significantly hinders access for all students to First Nations science capital. Our analysis highlights key examples from the curriculum below.

Eurocentric bias of curriculum, experiences, and access to First Nations science capital

We draw attention to one elaboration listed within the Year 10 content descriptor AC9S10H03 (*Analyse the key factors that contribute to science knowledge and practices being adopted more broadly by society*) (ACARA, 2023c). The elaboration of interest is the following: '*considering how the traditional ecological knowledges of First Nations Australians are being reaffirmed by modern science and how these practices are being used by Traditional Owners in carbon farming initiatives*', (para.3). This elaboration is focused on the 'traditional ecological knowledges of First Nations Australians' and how they are 'reaffirmed by modern science'. The wording used here, suggesting that First Nations perspectives require validation by modern (Western) science, can be viewed as implying a hierarchy of knowledge. Western science is positioned as the benchmark to meet. This inadvertently positions First Nations perspectives as deficit, static, a way of knowing from the past-it is a form of epistemic imperialism. As discussed, the way in which the curriculum is designed and phrased plays a critical role in either promoting or inhibiting access to diverse forms of science capital. When First Nations narratives are relegated to brief mentions or hidden within optional sections of the curriculum, it communicates to

educators a lesser perceived value of this knowledge. The existing curriculum perpetuates a cycle in which educators, influenced in part by its structure, overlook or undervalue First Nations perspectives in science. Such practices contribute to the perpetuation of systemic biases and inequalities, and reinforce institutional racism within science education.

Science educators regularly highlight Western discoveries and scientists (preferring Einstein to Unaipon, for instance), specific modes of communication (notably formal report writing), and the sophisticated use of technical terminology (Paige et al., 2023). Western ontological and epistemic perspectives are given preference, fostering a sense of alienation among First Nations students – a disconnect between their cultural identities and learning science. As one important element of broader inequities in the science classroom, the curriculum's design marginalises or outright dismisses other ways of knowing and understanding the natural world. The result is a form of science education that not only lacks cultural awareness, but also limits students' exposure to ontological and epistemic diversity, failing to recognise the validity of knowledge systems that do not conform to Western norms. There is a need for curriculum reform that not only recognises the validity and value of diverse scientific traditions but also integrates these perspectives into its core design, rather than treating them as peripheral or optional. Such integration will enrich students' understanding of science, highlighting it as a multifaceted, cultural endeavour rather than a detached, objective pursuit. Ultimately, a curriculum that genuinely embraces diversity in scientific thought and practice will cultivate deeper, more diverse science capital understanding. In sum, the present structure of the curriculum results in an overly narrow conceptualisation of what constitutes science, and therefore, students' access to First Nations' science capital is negatively impacted. Stakeholders should question the assumptions that underpin the current curriculum and broaden the scope of its design to be more inclusive, ensuring that all students see themselves reflected in the science curriculum.

Research Q2: how might a reimagined science curriculum enhance the place of First Nations perspectives in the syllabus?

Reimagining the science curriculum opens significant opportunities to enhance students' engagement with First Nations science capital, underscoring the vital role of flexibility and adaptability in curriculum design. This adaptability is key in enabling educators to effectively integrate local contexts and the regional science capital of communities, thereby fostering a curriculum that resonates on a more personal level. Personalisation and localisation is essential in shifting away from mandating uniform content towards encouraging questions or challenges that invite local exploration (Godec et al., 2017). At the same time, this reimagined approach retains the capacity to delve into concepts and perspectives consistent across different First Nations countries, bridging local experiences with broader science understandings and perspectives. Achieving this balance demands a nuanced approach in developing outcomes that are broad enough to encompass both local explorations and overarching scientific concepts, illustrating the interconnectedness of local and global perspectives. The use of open-ended language is critical for this purpose, as it invites diverse interpretations and applications. For instance, inviting students to 'share stories from your First Nations community that illustrate the impact of climate change' and questioning 'how these stories might align with the different forms of

evidence discussing climate change impacts' exemplifies how curriculum can simultaneously be locally grounded and globally aware, thus nurturing richer, more inclusive access to students' science capital. The inherent risk in adopting a more open-ended curriculum is the potential for it to become overly broad and lacking in structure, which can lead to difficulties in achieving educational objectives and mapping a coherent educational pathway. Consequently, this is a tension that curriculum designers and other stakeholders must navigate carefully.

Educators require more opportunities to collaboratively create learning experiences alongside First Nations stakeholders (Armour & Miller, 2021) that prioritises science in the local community (Harrison et al., 2019). Co-constructing learning experiences with First Nations groups allows for richer embedding of First Nations perspectives, culture, and languages. This integration enriches the science experience and transcends the Eurocentric paradigm students commonly are bounded by. Educators and students should be given the opportunity to 'specialise' in the knowledge of their local First Nations Country by engaging local communities, including First Nations groups in the development and delivery of land and place-based curriculum (Semken et al., 2017; Tuck et al., 2014). Through both land and place-based curriculum, students can engage with science in a way that is directly relevant to their immediate surroundings, promoting a deep sense of connection and respect for local environments and cultural heritage. Their involvement fosters learning of local First Nations science capital. A reimagined science curriculum is flexible enough to support these types of partnerships between schools and their local communities.

Consequently, we advocate for reform of the Australian Curriculum to better integrate First Nations perspectives throughout its structure, including strands, substrands, and content descriptions. Reform needs to change First Nations science from optional elaborations to core elements of the curriculum. This enhancement would ideally increase the likelihood of students engaging meaningfully with First Nations science capital as part of their science education. The proposed changes demand a curriculum that is flexible enough to prioritise local learning experiences, developed in partnership with First Nations stakeholders. At the same time, the curriculum needs to be expansive enough to include foundational practices, ontological and epistemic dimensions, as previously mentioned, in the ways they are understood and applied across different First Nations countries. This shift needs to also be supported by allocating sufficient professional learning resources to meet these new expectations. In addition, educators may need to embark on their own learning journey about First Nations cultures (Hradsky, 2022). As emphasised by Bishop (2020), 'teachers must critically reflect on their own identity and how it potentially influences their personal bias and worldview. They must also be willing to confront the ongoing effects of colonialism in and outside the classroom and listen to First Nations people' (para. 17). Professional learning that supports educators to identify and celebrate diverse forms of students' science capital is an important part of reimaging a more inclusive science classroom (Archer et al., 2013; Godec et al., 2017).

First Nations students' identity(ies) and access to First Nations science capital

In the process of reimagining the science curriculum to enhance First Nations science capital, it is important to consider other associated factors. As discussed, a reimagined

curriculum will inevitably call for different pedagogy and assessment methods; however, these aspects are largely beyond the scope of this article. Nonetheless, it is important to briefly discuss how curriculum design can positively influence these related elements. As discussed, First Nations storytelling methods, inclusive of oral storytelling, visual arts, and dance, are essential in representing scientific concepts and explaining the interconnectedness of people, knowledge, and the environment. Although the curriculum commonly tends to preference Western forms of representation (e.g. science reports, essays, graphs etc.), curriculum designers should embed more opportunities in the science curriculum for students to represent their understandings through artifacts conducive to promoting First Nations science capital. For instance, content descriptor *AC9S1I06* (ACARA, 2023d) includes an elaboration: '*acknowledging and learning about First Nations Australians' ways of representing and sharing observations*'. While it is in the optional elaboration section, moving these expectations to core parts of the curriculum will encourage educators to draw on First Nations ways of meaning making in science. Such approaches can authentically connect with students' First Nations science capital. In promoting such experiences, the curriculum not only acknowledges the richness of First Nations knowledge systems but also promotes engaging ways for students to represent their science understanding. When students recognise their own cultural and personal ties mirrored in learning, their connection to science deepens, making it more personally relevant and meaningful (Cooper, Fricker, et al., 2022). The former not only empowers First Nations students to see themselves as valuable contributors to the scientific community but also enriches the educational experience for all students, cultivating a deeper appreciation for the ways in which science is understood and represented across cultures.

Conclusion

In this article, we have critically examined the inclusion of First Nations perspectives in the newly updated Australian Curriculum: Science (V9). Our analysis reveals that despite recent revisions, the curriculum continues to, by design, marginalise and silence the perspectives of First Nations communities. This significant oversight not only undermines the science capital of First Nations students but also promotes a narrow Eurocentric view of science. There is potential for a transformative, groundbreaking curriculum, one that more deeply values and integrates First Nations science capital. This approach, emphasises localisation, co-construction with First Nations communities and a shift of First Nations perspectives to different parts of the curriculum: all towards the goal of promoting students' First Nations science capital. By making the curriculum more inclusive and reflective of diverse scientific perspectives, educators are better positioned to promote a learning environment where First Nations students feel a true sense of belonging and see their culture celebrated. Further exploration of the dynamics involved in co-designing the curriculum with First Nations stakeholders, and understanding how such collaboration can enrich the exchange of science capital, is also crucial. To sum up, reimagining the science curriculum necessitates a fundamental shift beyond its current Eurocentric focus. This involves embedding a broader diversity of science capital, drawing from a wider array of global perspectives and methodologies, inclusive of First Nations science capital. By incorporating more varied perspectives, students are better

equipped to understand and engage with the complex, multicultural world of science and their communities, fostering a more inclusive and equitable approach to science education.

Notes

1. We have chosen to use the term First Nations in this paper to include all Aboriginal, Torres Strait Islander, and Indigenous contexts. We have done so to maintain consistency with the updated Australian Curriculum and to ensure that the diversity of First Nations knowledges is reflected in this paper through the use of the plural Nations. We also acknowledge that this term is crucial to centre the unceded stolen First Nations' land in so-called Australia and the ongoing fight for land justice. We acknowledge that this term is not universally accepted by First Nations communities in Australia, and we use it with respect.
2. Country in this context relates to the unceded traditional lands of First Nations Peoples across the Australian continent and the adjacent islands. In this context, Country also relates to the special connection that First Nations people have to place, as well as the knowledges, ancestors, Dreamings, spirits, stories, songs, pasts and futures that are conceptualised through a First Nations connection to Country.
3. The universalist approach to the discipline area of science in the Australian Curriculum Version 9 is reinforced by the cross-curriculum priority of "Asia and Australia's Engagement with Asia" being noticeably absent from the list of cross-curriculum priorities relevant to the science curriculum on ACARA's website (2023a, para.32), thereby overlooking the significant contributions to scientific knowledge and inventions from, for example, Chinese and Islamic sciences. A discussion of the contributions of Asian cultures to scientific knowledge, and the effect of their neglect on the engagement of Asian background students with science education is beyond the scope of this article, but it does provide an obvious example of an omission within a curriculum that is still largely framed by Eurocentric content and Western ways of conceptualising and *doing* science.

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