

From mere exposure to embodied environmental reconnection: a pedagogical model for designing nature connectedness, ecological awareness, and pro–environmental attitudes

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Abstract: This contribution is situated within the fields of environmental education, sustainability education, and embodied cognition, framing the growing disconnection between human beings and the environment not only as a cognitive or cultural issue, but also as a corporeal, perceptual, affective, and relational one. In contemporary contexts increasingly shaped by mediated and fragmented experiences, relationships with nature may remain at the level of environmental contact without necessarily developing into meaningful forms of ecological engagement. The paper challenges the assumption that spending time in natural environments automatically generates ecological sensitivity or pro–environmental attitudes. Research suggests that environmental exposure alone does not necessarily foster nature connectedness, environmental identity, or environmentally responsible behaviours (Collado & Corraliza, 2015; Hinds & Sparks, 2008; Pirchio et al., 2021; Finestrone et al., 2025). Rather, the educational significance of environmental experiences depends on how bodily perception, affect, interpretation, relational engagement, and pedagogical mediation interact within specific socio-cultural and ecological contexts.

The contribution has a twofold aim: to theoretically delineate Embodied Environmental Reconnection as an integrative educational construct and to propose the Embodied Environmental Reconnection Model (EERM), developed through a critical conceptual reconsideration of Priest’s Outdoor Education Tree. The model identifies four interrelated core processes—Bodily Awareness, Affective Resonance, Meaning Making, and Ecological Relating—conceptualised as dynamically interacting rather than sequential stages. These processes operate within socio-cultural and ecological contexts, are supported by enabling conditions such as environmental contact and pedagogical mediation, and are permeated by embodied engagement as a cross-cutting principle. Their interaction may contribute to possible outcomes including nature connectedness, ecological awareness, environmental identity, sustainability competences, and ecological agency. The EERM is presented as a process-oriented theoretical framework for sustainability-oriented educational design whose internal relationships and educational applicability require further empirical investigation.

Keywords: Embodied environmental reconnection; embodied cognition; environmental education; nature connectedness; sustainability education.



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1. Introduction

The growing environmental challenges of the twenty-first century, including climate change, biodiversity loss, environmental degradation, and increasing urbanisation, have intensified educational interest in the relationship between human beings and the natural world (UNESCO, 2020, 2021; Sterling, 2021). Within this context, environmental and sustainability education have increasingly emphasised the importance of strengthening learners' relationships with nature as a means of supporting ecological awareness, environmental responsibility, and more sustainable ways of living.

A substantial body of research has documented the benefits associated with experiences in natural environments, linking contact with nature to psychological well-being, restoration, emotional regulation, social development, environmental concern, and pro-environmental behaviour (Mayer & Frantz, 2004; Hinds & Sparks, 2008; Collado & Corraliza, 2015; Pirchio et al., 2021). Outdoor education has played a central role in promoting direct engagement with natural settings as a means of supporting personal growth, environmental understanding, and relational development (Priest, 1986; Priest & Gass, 2018).

However, contemporary research increasingly suggests that the relationship between environmental exposure and ecological engagement is neither linear nor automatic. Spending time in nature does not necessarily foster nature connectedness, environmental identity, or ecological responsibility, and educational experiences in natural settings do not inevitably become meaningful forms of environmental learning. Rather, their educational significance depends on how learners perceive, engage with, interpret, and attribute meaning to their experiences (Hinds & Sparks, 2008; Collado & Corraliza, 2015; Pirchio et al., 2021; Sterling, 2021; Wals, 2015). This issue is particularly relevant in societies characterised by increasing urbanisation, digital mediation, and the fragmentation of everyday environmental experiences (Louv, 2008; Soga & Gaston, 2016). The central educational question is therefore not simply whether contact with nature matters, but through which processes environmental experiences may develop into meaningful forms of ecological engagement.

Several research traditions provide complementary perspectives on this question. Research on nature connectedness has highlighted the importance of affective attachment and a sense of belonging to the natural world (Mayer & Frantz, 2004; Richardson et al., 2020), while environmental identity research has shown how ecological commitment may become integrated into processes of self-construction and relational belonging (Clayton, 2003; Clayton et al., 2021). Embodied cognition, in turn, conceptualises perception, action, emotion, and cognition as emerging through continuous interactions between individuals and their environments (Varela et al., 1991; Wilson, 2002; Shapiro & Stolz, 2019). Sustainability education further emphasises reflection, participation, and transformative learning as important foundations for environmentally responsible action (Sterling, 2021; UNESCO, 2020). Outdoor education contributes an experiential and relational perspective centred on direct engagement with environments (Priest, 1986; Priest & Gass, 2018).

Although these traditions have significantly advanced understanding of human-nature relationships, they have largely developed along parallel theoretical trajectories. Existing frameworks provide substantial accounts of outcomes associated with environmental experiences, including nature connectedness, environmental identity, sustainability competences, and pro-environmental behaviour, but compar-

atively less attention has been devoted to the processes through which environmental experiences acquire ecological and educational significance. A theoretical gap therefore remains between environmental contact and the emergence of more complex forms of ecological awareness, identity, and agency.

To address this gap, the present paper proposes the concept of Embodied Environmental Reconnection, understood as an educational process through which bodily, affective, perceptual, and interpretative engagement with natural environments may contribute to ecological awareness, environmental identity, and responsible participation within socio-ecological systems. Building on a critical conceptual reconsideration of Priest's Outdoor Education Tree (1986), the paper develops the Embodied Environmental Reconnection Model (EERM) as an integrative theoretical framework bringing into dialogue five complementary research traditions: outdoor education, embodied cognition, nature connectedness research, environmental identity studies, and sustainability education.

The paper therefore pursues two objectives: (a) to theoretically delineate Embodied Environmental Reconnection as an integrative educational construct, and (b) to propose the EERM as a process-oriented framework for examining how environmental experiences may contribute to nature connectedness, ecological awareness, environmental identity, sustainability competences, and ecological agency. Rather than assuming a direct progression from environmental contact to pro-environmental outcomes, the model conceptualises ecological engagement as emerging through embodied, mediated, relational, and socio-culturally situated processes. The EERM is presented as a theoretical proposal whose internal relationships and educational applicability require further empirical investigation.

2. Revisiting Priest's Outdoor Education Tree: foundations and contemporary challenges

Among the influential conceptual frameworks in outdoor education, Priest's Outdoor Education Tree (Priest, 1986) offers a relational account of learning in and through outdoor environments. Developed within the broader tradition of experiential education, the model brings together environmental education, experiential learning, and personal development within a unified conceptual structure. Rather than treating outdoor education as mere exposure to natural settings, Priest conceptualised it in terms of relationships involving the self, other people, ecosystems, and the interactions between human communities and their environments, expressed through intrapersonal, interpersonal, ecosystemic, and ekistic relationships.

A continuing strength of the model lies in its emphasis on direct experience and relational learning. Its focus on interaction with the environment can be situated within the broader experiential tradition associated with Dewey (1938) and Kolb (1984), while its relational structure recognises that outdoor educational experiences involve personal, social, and ecological dimensions rather than exclusively cognitive ones (Priest, 1986; Priest & Gass, 2018). This relational orientation provides an important conceptual foundation for reconsidering how engagement with natural environments may acquire educational significance.

At the same time, subsequent developments in environmental psychology, embodied cognition, environmental identity research, and sustainability education make it possible to reconsider aspects of Priest's framework that remain comparatively underdeveloped (Clayton, 2003; Shapiro & Stolz, 2019; Sterling, 2021). In particular,

while the Outdoor Education Tree identifies several forms of relationship associated with outdoor learning, it provides less detailed conceptualisation of the processes through which environmental experiences may contribute to their development.

First, research on nature connectedness and environmental identity suggests that contact with natural environments does not in itself ensure the development of enduring ecological relationships, identity, or responsibility (Mayer & Frantz, 2004; Hinds & Sparks, 2008; Collado & Corraliza, 2015; Pirchio et al., 2021). The educational significance of environmental contact therefore depends not only on its occurrence, but also on how individuals perceive, experience, interpret, and attribute meaning to such encounters.

Second, embodied perspectives extend this account by conceptualising cognition as emerging through ongoing interactions among perception, action, emotion, bodily experience, and environment (Varela et al., 1991; Wilson, 2002; Gallagher, 2006; Shapiro, 2019). From this perspective, sensory and bodily engagement cannot be understood solely as an initial point of contact with the environment. Rather, embodiment may operate throughout the learning process, shaping how experiences are perceived, emotionally experienced, interpreted, and incorporated into broader forms of understanding (Shapiro & Stolz, 2019; Beery, 2013; Payne & Wattchow, 2009).

Third, contemporary experiential and sustainability-oriented approaches draw greater attention to pedagogical mediation. Reflection, dialogue, interpretation, and guided meaning-making can support the transformation of experience into learning by helping learners examine, articulate, and contextualise what they encounter (Dewey, 1938; Kolb, 1984; Sterling, 2021; UNESCO, 2020). Priest's framework acknowledges experiential learning, but gives comparatively limited theoretical attention to these mediating processes.

Finally, contemporary approaches foreground the socio-cultural conditions within which human-nature relationships develop. Environmental identity may be influenced by cultural narratives, social relationships, educational opportunities, community contexts, and access to environmental experiences (Clayton, 2003; Gruenewald, 2003; Greenwood, 2013; Olivos & Clayton, 2017; Clayton et al., 2021; Finestrone et al., 2025). In parallel, Education for Sustainable Development and frameworks such as GreenComp emphasise participation, responsibility, sustainability competences, and agency as significant educational aims (UNESCO, 2020, 2021; Bianchi et al., 2022; Sterling, 2021; Wals, 2015).

Taken together, these perspectives do not invalidate Priest's Outdoor Education Tree; rather, they provide a basis for extending its relational insights. In particular, they indicate the need for a more explicit account of the processes through which environmental encounters may acquire perceptual, affective, interpretative, relational, and educational significance, while also taking pedagogical mediation and socio-cultural context into account. The EERM builds on this foundation by proposing a process-oriented conceptual framework designed to articulate these relationships without assuming a linear or automatic progression from environmental contact to ecological outcomes.

3. From Environmental Exposure to Ecological Connection: A Missing Theoretical Link

A recurring assumption within environmental and outdoor education is that contact with nature can, in itself, foster ecological awareness and environmental

concern. This assumption informs a range of educational practices, including outdoor learning initiatives, school gardens, green schools, and nature-based educational programmes (Chawla, 2020; UNESCO, 2020). However, research on human-nature relationships indicates that environmental contact and ecological engagement should not be treated as equivalent processes.

Studies of nature connectedness, environmental identity, and pro-environmental behaviour suggest that the frequency or duration of contact with natural environments alone does not account for the quality or educational significance of human-nature relationships (Mayer & Frantz, 2004; Hinds & Sparks, 2008; Collado & Corraliza, 2015). Affective attachment, subjective interpretation, environmental identity, and processes of meaning attribution contribute to how individuals relate to natural environments and how such relationships may become associated with environmentally responsible orientations and behaviours (Clayton, 2003; Olivos & Clayton, 2017; Clayton et al., 2021).

This distinction is particularly relevant in contemporary contexts characterised by urbanisation, digital mediation, and increasingly fragmented opportunities for direct engagement with natural environments (Louv, 2008; Soga & Gaston, 2016). Under these conditions, the presence of environmental contact does not necessarily indicate that an experience has acquired enduring perceptual, affective, relational, or educational significance (Chawla, 2020).

Existing theoretical traditions have provided substantial accounts of constructs and outcomes associated with human-nature relationships, including nature connectedness (Mayer & Frantz, 2004), environmental identity (Clayton, 2003), pro-environmental behaviour (Schultz, 2002), ecological citizenship (Dobson, 2003), and sustainability competences (Bianchi et al., 2022). Comparatively less attention has been devoted to integrating the processes through which environmental encounters may acquire meaning and contribute to the development of such forms of ecological engagement. The relationship between environmental contact and these more complex ecological orientations can therefore be understood as a theoretical “black box”: relevant processes have been examined across different research traditions, but their interrelations have not always been articulated within a shared educational framework.

Addressing this gap requires an account of environmental learning that incorporates bodily perception, action, affect, interpretation, relational experience, and pedagogical mediation. Embodied and experiential perspectives conceptualise learning as emerging through situated interactions among individuals, their bodies, and their environments, rather than through cognition considered in isolation (Dewey, 1938; Kolb, 1984; Varela et al., 1991; Wilson, 2002; Shapiro & Stolz, 2019). From this perspective, ecological engagement is not conceptualised as the endpoint of a predetermined sequence beginning with environmental exposure, but as a potentially recursive and context-dependent process in which perceptual, affective, interpretative, and relational forms of engagement may interact.

The concept of Embodied Environmental Reconnection is proposed as an integrative educational construct for describing this process. The term reconnection refers to the possibility of strengthening human-nature relationships that may have become attenuated within contemporary socio-cultural contexts characterised by reduced or fragmented everyday engagement with natural environments (Louv, 2008; Soga & Gaston, 2016). The term embodied foregrounds the role of bodily perception,

movement, affect, and situated interaction in how environmental experiences are encountered and interpreted (Shapiro & Stolz, 2019).

Embodied Environmental Reconnection is therefore conceptualised as an educational process through which bodily, affective, perceptual, interpretative, and relational engagement with natural environments may contribute to the development of ecological awareness, environmental identity, and responsible participation within socio-ecological systems. Rather than defining a linear progression from contact to predetermined outcomes, the construct provides a conceptual basis for examining the interacting processes through which environmental experiences may acquire ecological and educational significance. This conceptualisation provides the theoretical basis for the Embodied Environmental Reconnection Model (EERM), whose architecture is developed in the following section.

4. Conceptual development and core processes of the embodied environmental reconnection model

The Embodied Environmental Reconnection Model (EERM) was developed through a critical conceptual synthesis of literature drawn from five complementary research traditions: outdoor education, embodied cognition, nature connectedness research, environmental identity studies, and sustainability education (Priest, 1986; Wilson, 2002; Mayer & Frantz, 2004; Clayton, 2003; Sterling, 2021). The purpose of this synthesis was not to provide an exhaustive or systematic review of research on human-nature relationships, but to identify theoretical perspectives capable of illuminating complementary aspects of the educational processes through which environmental encounters may acquire ecological significance.

The literature considered in the conceptual development of the model was selected for its relevance to a set of recurring theoretical concerns: direct environmental experience; bodily and perceptual engagement; affective connection; interpretation and meaning-making; relational and identity-based dimensions of human-nature relationships; pedagogical mediation; socio-cultural situatedness; and sustainability-oriented participation. Foundational contributions within each research tradition were considered alongside subsequent studies that extended, refined, or problematised these perspectives. The synthesis therefore focused on conceptual relevance and complementarity rather than on comprehensive coverage of each field.

The five traditions were subsequently examined comparatively in order to identify recurrent and complementary processes relevant to environmental learning. Rather than assigning each research tradition to a separate component of the model, the analysis considered how concepts emerging across different fields could be organised according to their educational function. This comparative conceptual synthesis led to the identification of four interrelated core processes: Bodily Awareness, Affective Resonance, Meaning Making, and Ecological Relating.

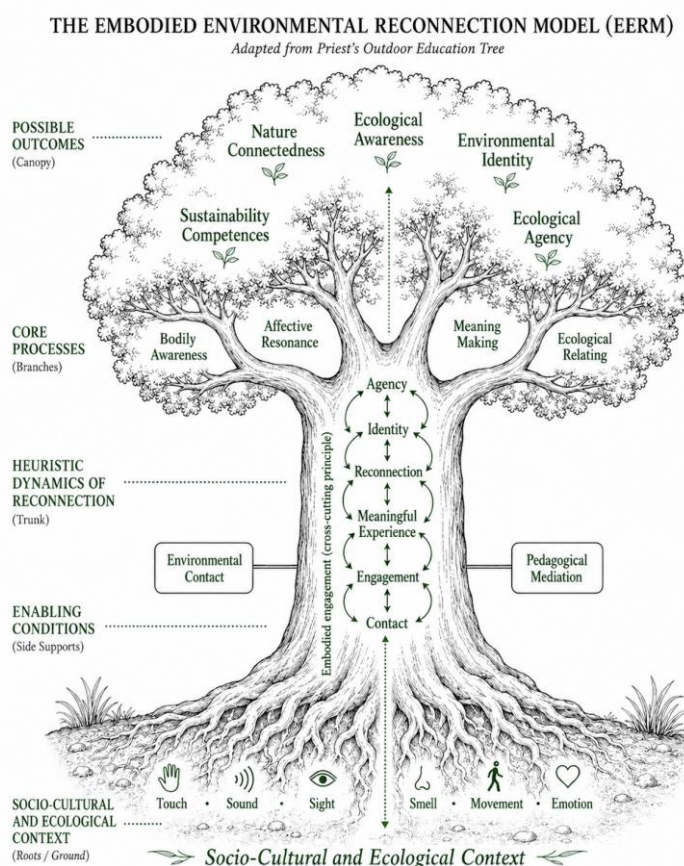
These four processes should be understood as theoretically derived analytical distinctions rather than as empirically discrete components or sequential stages. They do not correspond on a one-to-one basis to the five theoretical traditions from which the framework draws; instead, each process integrates insights from multiple fields. Bodily Awareness foregrounds sensory, perceptual, and embodied engagement; Affective Resonance captures the emotional significance of environmental encounters; Meaning Making concerns processes of interpretation, reflection, and symbolic elaboration; and Ecological Relating concerns the development of relational under-

standings of belonging, interdependence, and responsibility within socio-ecological systems.

The four processes are conceptualised as dynamically interacting and potentially mutually reinforcing, with their relative prominence varying across learners, contexts, and educational experiences. Through their interaction, they may contribute to possible outcomes including nature connectedness, ecological awareness, environmental identity, sustainability competences, and ecological agency. The distinction between core processes and outcomes is therefore central to the architecture of the EERM: the former describe theoretically proposed processes through which environmental experiences may acquire ecological and educational significance, whereas the latter refer to possible emergent orientations, competences, and forms of participation.

The resulting architecture was then reconsidered in relation to Priest's Outdoor Education Tree. The EERM retains Priest's relational and experiential orientation while extending it through concepts drawn from embodied, affective, interpretative, socio-cultural, identity-based, and sustainability-oriented perspectives. In this sense, the model constitutes a theoretical elaboration rather than an empirical validation of Priest's framework. The conceptual distinctions and relationships proposed by the EERM remain open to subsequent theoretical refinement and empirical investigation.

Figure 1. The Embodied Environmental Reconnection Model (EERM).



4.1 Bodily Awareness

Bodily Awareness refers to the sensory, perceptual, and embodied processes through which individuals encounter and attend to the natural world. Consistent with embodied approaches to cognition, perception, action, emotion, and understanding emerge through ongoing interactions between individuals and their environments (Varela et al., 1991; Wilson, 2002; Gallagher, 2006; Shapiro, 2019). Within the EERM, bodily awareness foregrounds the role of movement, proprioception, sensory exploration, and attentional engagement in shaping how environmental experiences are encountered and interpreted (Noë, 2004; Beery, 2013; Payne & Wattchow, 2009; Beery & Jørgensen, 2018). It should therefore be understood not as an initial stage of the model, but as a process that may remain active throughout an environmental learning experience.

4.2 Affective Resonance

Affective Resonance refers to the emotional attunement that may develop through encounters with natural environments. Research on human-nature relationships has highlighted the relevance of affective experiences such as wonder, fascination, empathy, care, and belonging to environmental concern, nature connectedness, and pro-environmental orientations (Kals et al., 1999; Mayer & Frantz, 2004; Hinds & Sparks, 2008; Schultz, 2002; Richardson et al., 2020). Within the EERM, affective resonance describes the process through which environmental encounters may acquire personal and emotional significance, thereby contributing to more sustained forms of ecological engagement (Colombetti, 2014; Shapiro & Stolz, 2019). It is conceived as interacting continuously with bodily perception, interpretation, and relational understanding rather than following them in a predetermined sequence.

4.3 Meaning Making

Meaning Making refers to the interpretative processes through which environmental experiences are reflected upon, articulated, and integrated into broader forms of understanding. Experiential approaches suggest that educational significance is not inherent in experience alone, but may be developed through reflection, dialogue, narration, aesthetic engagement, and critical interpretation (Dewey, 1938; Kolb, 1984; Brady, 2003; Carlson, 2005; Quay & Seaman, 2013). Within the EERM, pedagogical mediation can support meaning-making by creating opportunities for learners to connect situated experiences with wider ecological, cultural, and ethical understandings (Priest & Gass, 2018; Sterling, 2021). Artistic, musical, and embodied forms of expression may provide additional modes through which environmental experiences can be explored, represented, and interpreted (Leman, 2007; Godøy & Leman, 2010).

4.4 Ecological Relating

Ecological Relating refers to the relational processes through which individuals may come to recognise themselves as participants within broader networks of ecological interdependence. It involves interpreting human-nature relationships in relational, ethical, and identity-relevant terms and developing an awareness of belonging, responsibility, and participation within the more-than-human world (Thomashow,

1996; Bonnett, 2017). The process draws on research concerning environmental identity, place attachment, place-conscious and relational approaches to environmental education, and ecological citizenship (Clayton, 2003; Gruenewald, 2003; Greenwood, 2013; Dobson, 2003; Olivos & Clayton, 2017; Clayton et al., 2021). Within the EERM, Ecological Relating does not constitute environmental identity itself; rather, it describes relational processes that may contribute to the development of environmental identity and other forms of ecological participation. Like the other core processes, it is conceived as dynamically interconnected with bodily, affective, and interpretative engagement.

5. The Embodied Environmental Reconnection Model (EERM)

The EERM organises the theoretical elements introduced in the previous sections into a coherent conceptual architecture. The model distinguishes between the socio-cultural and ecological context in which environmental learning occurs, the conditions that may support meaningful engagement, a cross-cutting principle of embodied engagement, four core processes of Embodied Environmental Reconnection, and a set of possible emergent outcomes. These elements are analytically distinguishable but dynamically interrelated; the model does not assume that environmental learning develops through a fixed or universally ordered sequence.

5.1 *Socio-Cultural and Ecological Context*

The outer layer of the EERM represents the socio-cultural and ecological context within which environmental experiences occur and acquire meaning. This contextual layer addresses an aspect that is comparatively less explicit in Priest's original framework by acknowledging that human-nature relationships are shaped by cultural narratives, social practices, educational opportunities, community contexts, and differential access to natural environments (Gruenewald, 2003; Greenwood, 2013; Clayton et al., 2021). Ecological awareness and environmental identity are therefore understood as situated phenomena that develop within broader socio-ecological systems rather than through isolated encounters with nature.

Embodied engagement operates across this contextualised architecture as a cross-cutting principle rather than as an additional process or dimension. Consistent with embodied cognition, perception, action, affect, and interpretation remain interdependent throughout environmental learning, shaping how individuals encounter, experience, interpret, and relate to the natural world (Varela et al., 1991; Wilson, 2002; Shapiro & Stolz, 2019). Embodiment therefore permeates the four core processes described in Section 4 rather than constituting a separate fifth process.

5.2 *Enabling conditions: environmental contact and pedagogical mediation*

Within the visual architecture of the model, the trunk represents the interaction between opportunities for direct environmental contact and pedagogical mediation. Outdoor education can provide situated opportunities for engagement with natural environments (Priest, 1986; Priest & Gass, 2018), while pedagogical mediation may support learners in attending to, interpreting, articulating, and integrating their expe-

riences through reflection, dialogue, narration, artistic expression, and aesthetic engagement.

Pedagogical mediation is therefore conceptualised as an enabling condition rather than as a necessary or universally sufficient condition for ecological learning. Its role may vary according to context, learner characteristics, the nature of the environmental experience, and the educational setting. Within the EERM, mediation can support the interaction of the core processes without determining their occurrence or guaranteeing particular outcomes.

5.3 Core processes of Embodied Environmental Reconnection

The central structure of the EERM comprises four interconnected core processes: Bodily Awareness, Affective Resonance, Meaning Making, and Ecological Relating. As developed in Section 4, these processes refer respectively to perceptual and sensory engagement, affective significance, interpretative activity, and relational awareness within human-nature encounters.

Their separation within the model is analytical rather than sequential. Bodily awareness may influence affective resonance; affective experience may shape meaning-making; interpretation may transform relational understanding; and emerging ecological relationships may, in turn, reshape perception, attention, and affect. The processes can therefore interact recursively and with different degrees of intensity across educational contexts and experiences.

5.4 Possible outcomes: from nature connectedness to ecological agency

The EERM proposes that the interaction of its core processes, within particular contextual and educational conditions, may contribute to a range of interconnected outcomes, including nature connectedness, ecological awareness, environmental identity, sustainability competences, and ecological agency (UNESCO, 2020; Sterling, 2021; Bianchi et al., 2022).

These outcomes are not conceptualised as predetermined endpoints or as necessarily successive levels of development. Rather, they represent possible and partially overlapping expressions of ecological engagement. Nature connectedness refers to an experienced sense of relationship with the natural world; ecological awareness concerns recognition and understanding of ecological interdependence; environmental identity refers to the integration of environmental relationships into self-understanding; sustainability competences concern the knowledge, dispositions, and capacities relevant to sustainability-oriented participation; and ecological agency refers to the capacity to participate in environmentally responsible forms of action.

The distinction between processes and outcomes is fundamental to the model. Bodily Awareness, Affective Resonance, Meaning Making, and Ecological Relating describe interacting processes through which environmental experiences may acquire ecological significance, whereas nature connectedness, ecological awareness, environmental identity, sustainability competences, and ecological agency describe possible emergent consequences of these processes.

5.5 Heuristic dynamics of reconnection

The EERM also distinguishes six heuristic reference points that may be useful for interpreting how environmental experiences develop over time: contact, engagement, meaningful experience, reconnection, identity, and agency. These terms should not be understood as formal stages or as a developmental sequence that learners must follow in a fixed order. Instead, they describe possible configurations within an evolving process of environmental learning.

Contact refers to an encounter with a natural environment, while engagement involves active perceptual, bodily, affective, or attentional involvement in that encounter. An experience may become meaningful when it is affectively significant, interpreted, reflected upon, or integrated with previous understandings. Reconnection refers to an emerging or strengthened sense of relationship and belonging within ecological systems. Identity concerns the possible incorporation of such relationships into self-understanding, while agency refers to the capacity to participate in environmentally responsible forms of action.

The relationship among these reference points is recursive rather than linear. Agency may generate new forms of environmental contact and engagement; existing environmental identities may shape how subsequent experiences are perceived and interpreted; and meaningful experiences may strengthen, weaken, or transform existing relationships with natural environments. The four core processes described by the EERM operate across these possible configurations rather than corresponding individually to particular reference points.

The EERM therefore extends Priest's Outdoor Education Tree by proposing a process-oriented and context-sensitive account of how environmental encounters may acquire ecological and educational significance. Its contribution lies not in prescribing a universal developmental pathway, but in articulating how embodied engagement, pedagogical mediation, socio-cultural context, and relational processes may interact in the emergence of nature connectedness, ecological awareness, environmental identity, sustainability competences, and ecological agency.

6. Educational Implications: Designing for Embodied Environmental Reconnection

The EERM suggests that environmental education should attend not only to opportunities for contact with nature, but also to the quality and organisation of learners' engagement with environmental experiences. From the perspective of the model, nature connectedness, ecological awareness, environmental identity, sustainability competences, and ecological agency may be supported through the interaction of perceptual, affective, interpretative, and relational processes rather than being assumed to follow automatically from environmental contact.

This process-oriented perspective has implications for pedagogical design. Pedagogical mediation may create conditions that support learners in attending to, interpreting, articulating, and reflecting upon their environmental experiences. Practices such as dialogue, storytelling, guided observation, collaborative inquiry, and reflective activities can provide opportunities for learners to connect situated experiences with broader ecological, cultural, and ethical understandings (Sterling, 2021; Wals, 2015). Their educational role should not be understood as guaranteeing par-

ticular ecological outcomes, but as potentially supporting the interaction of the core processes identified by the EERM.

The model also draws attention to the potential contribution of embodied, artistic, and aesthetic forms of engagement. Movement, sensory exploration, music, and creative expression may offer different ways of attending to, representing, and interpreting relationships with natural environments. Within the EERM, such approaches are not proposed as inherently more effective than other pedagogical strategies, but as possible modes through which bodily, affective, and interpretative engagement can be supported.

The contextual dimension of the model further suggests that educational design should consider the social and cultural conditions within which environmental experiences take place. Opportunities for engagement with natural environments are not equally distributed, and learners may encounter nature through different cultural meanings, prior experiences, social practices, and forms of access (Finestrone et al., 2025). Incorporating these contextual differences into educational design may therefore contribute to greater attention to inclusion, accessibility, and environmental justice.

Overall, the EERM encourages a shift from educational approaches centred primarily on anticipated outcomes towards process-oriented design. Rather than assuming that exposure to nature will produce predetermined forms of ecological engagement, the framework directs attention to the conditions and interacting processes through which environmental experiences may acquire perceptual, affective, interpretative, relational, and ecological significance.

7. Conclusions

This paper addressed a theoretical gap in environmental and outdoor education concerning the processes through which encounters with natural environments may acquire ecological and educational significance. Rather than assuming a direct relationship between environmental contact and ecological outcomes, the paper proposed Embodied Environmental Reconnection as an integrative educational construct for examining how bodily, affective, interpretative, and relational engagement may contribute to more meaningful human-nature relationships.

Building on a critical conceptual reconsideration of Priest's Outdoor Education Tree and bringing into dialogue outdoor education, embodied cognition, nature connectedness research, environmental identity studies, and sustainability education, the Embodied Environmental Reconnection Model (EERM) offers a process-oriented and context-sensitive theoretical framework. Its contribution lies in distinguishing between the socio-cultural and ecological context of environmental learning, enabling conditions such as environmental contact and pedagogical mediation, embodied engagement as a cross-cutting principle, four interacting core processes, and a set of possible ecological and educational outcomes.

Within this architecture, Bodily Awareness, Affective Resonance, Meaning Making, and Ecological Relating are conceptualised as analytically distinct but dynamically interconnected processes rather than as sequential stages. Their interaction may contribute to nature connectedness, ecological awareness, environmental identity, sustainability competences, and ecological agency, without implying that these

outcomes emerge in a fixed order or as necessary consequences of environmental experience.

The EERM should therefore be understood as a conceptual proposal rather than as an empirically validated explanatory model. Its theoretical distinctions, internal relationships, and applicability across educational contexts require further investigation. Future research could examine whether and how the four core processes can be identified empirically, how they interact under different socio-cultural and pedagogical conditions, and which forms of educational mediation may support them across different age groups, learning environments, and cultural contexts. Empirical work will also be needed to explore the relationships between the processes proposed by the model and outcomes such as nature connectedness, environmental identity, sustainability competences, and ecological agency.

From an educational perspective, the EERM shifts attention from the mere provision of contact with nature to the conditions and processes through which environmental experiences may become meaningful. Its central proposition is not that environmental exposure necessarily produces ecological engagement, but that educational design can attend more explicitly to the embodied, affective, interpretative, relational, and contextual dimensions through which human-nature relationships are experienced and developed. In this sense, the model offers a theoretical basis for further research and for the development of educational practices aimed at supporting more reflective, situated, and sustainability-oriented relationships with the living world.

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