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THE TRANSDISCIPLINARY INFORMING MODEL: BRIDGING EPISTEMOLOGIES FOR BREAKTHROUGH INNOVATION

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ABSTRACT

Aim/Purpose	This paper addresses the need for more holistic informing frameworks that bridge cognitive-centric approaches with embodied, relational, and imaginative modes of knowledge transfer, especially within complex transdisciplinary contexts where conventional informing processes often fail to facilitate deep understanding.
Background	Current Informing Science frameworks primarily focus on cognitive processing and linear data flow, leaving significant gaps in understanding how knowledge can be effectively transferred through non-cognitive pathways. This paper extends Informing Science by integrating diverse epistemologies, including non-Western and phenomenological perspectives, into a cohesive visual model.
Methodology	Using practice-led research methodology, this study developed and tested the Transdisciplinary Informing Model (TIM) through the creation and implementation of an immersive sensory experience (Fractals of Nature). Approximately 150 participants, including art students, alumni, community members, and change-makers, engaged with three sensory stations, generating creative artifacts that were analyzed for evidence of relational knowledge creation.
Contribution	This paper contributes to Informing Science by visualizing and operationalizing Montuori's principles of transdisciplinary inquiry and extending Cohen's three-environment model to include embodied, sensory, and imaginative dimensions of knowledge transfer. The hexagonal model structure illustrates previously unseen interdependencies between principles, creating a practical framework for cross-epistemological synthesis.
Findings	Evidence from the Fractals of Nature case study demonstrates that TIM effectively facilitates: (1) relational knowledge creation that bridges individual per-

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	spectives with ecological awareness; (2) cross-paradigmatic synthesis across scientific, cultural, and imaginative domains; and (3) embodied knowledge processing through multisensory engagement, enabling deeper, more integrated understanding than cognitive processing alone.
Recommendations for Practitioners	Practitioners should consider incorporating sensory, relational, and imaginative elements into informing processes, particularly in educational, organizational, and sustainability contexts where complex, systemic understanding is essential. TIM provides a structured yet flexible framework for designing transdisciplinary experiences that engage multiple ways of knowing.
Recommendations for Researchers	Future research should explore TIM's applications across diverse cultural contexts, develop metrics for evaluating its impact on knowledge transfer, and investigate the long-term effects of embodied informing approaches. Researchers should also consider combining TIM with other informing frameworks to create hybrid approaches that leverage multiple models' strengths.
Impact on Society	TIM's approach to knowledge transfer has significant implications for addressing complex societal challenges that require integrated understanding across disciplines, cultures, and knowledge systems. By fostering embodied, relational understanding of interconnectedness, TIM could enhance public engagement with systemic issues like climate change, social inequality, and technological transformation. The framework's emphasis on ethical relationality provides a foundation for more inclusive decision-making processes that honor diverse epistemologies, potentially contributing to more equitable and sustainable social systems that bridge intellectual understanding with embodied, collective wisdom.
Future Research	Building on this paper's findings, future research should: (1) investigate TIM's effectiveness in digital and virtual environments where sensory engagement takes different forms; (2) explore applications in cross-cultural collaborations where diverse epistemologies must be bridged; (3) develop quantitative and qualitative metrics to assess the depth and retention of knowledge gained through embodied informing processes; (4) examine how TIM might enhance informing processes in complex fields like healthcare, environmental management, and technology ethics where siloed knowledge creates barriers to holistic understanding; and (5) investigate the relationship between embodied informing and behavior change, particularly in sustainability contexts where knowledge alone often fails to motivate action.

Keywords	Informing Science, transdisciplinary inquiry, embodied knowledge, sensory engagement, relational epistemology, knowledge transfer, systems thinking, creative synthesis, hexagonal model, practice-led research

INTRODUCTION: TRANSDISCIPLINARY INFORMING MODEL

This paper introduces the Transdisciplinary Informing Model (TIM), a framework that integrates diverse ways of knowing to support breakthrough thinking in complex contexts. Building on Montuori's (2005, 2012) principles and directly addressing Cohen's (2009) three-environment model of Informing Science, TIM bridges Western and non-Western epistemologies through embodied, relational, and imaginative inquiry. By extending Informing Science beyond cognitive-centric approaches into multisensory and systemic territories, TIM offers new pathways for knowledge flow across disciplines. The Fractals of Nature case study demonstrates how TIM facilitates deeper, more

integrated understanding through creative, sensory engagement, providing empirical evidence of its effectiveness as an innovative approach to informing.

Transdisciplinary informing integrates insights, methods, and approaches from multiple fields, enabling researchers and practitioners to navigate complex phenomena (Rigolot, 2020; Scholz & Steiner, 2015). Unlike interdisciplinary approaches, transdisciplinary informing transcends traditional boundaries to synthesize diverse knowledge forms, creating a holistic understanding of subjects. This approach recognizes that complex issues, such as social, environmental, or technological change, cannot be fully understood through a single discipline. Instead, it invites collaboration across fields, fostering systemic insights with practical applications. The Transdisciplinary Informing Model (TIM) serves as an integrative framework to facilitate cross-disciplinary collaborations and expand knowledge-sharing in complex environments.

TIM directly addresses the core mission of Informing Science – finding better ways to inform – by integrating diverse epistemologies into a cohesive framework that facilitates knowledge flow across disciplinary boundaries. It expands Informing Science's potential by introducing embodied, relational, and imaginative forms of knowledge transfer that engage users cognitively and experientially. While traditional informing models primarily focus on cognitive processing and data flow, TIM recognizes that profound understanding often emerges through sensory engagement, relational awareness, and imaginative synthesis – dimensions largely unexplored in existing informing frameworks.

TIM emerged from practice-led research, a form of academic inquiry that leverages creative processes to generate knowledge across varied fields (Candy, 2006; Haseman & Mafe, 2009). Practice-led research engages with creative practice not just as an output but as a method of inquiry, where the process produces valuable knowledge. TIM was developed to bridge the gap between theory and practice within transdisciplinary research, offering a structured yet flexible framework for navigating complex, multi-faceted challenges. By translating insights into an adaptable visual model, TIM facilitates a more accessible understanding of relational knowledge systems.

Montuori's (2005, 2012) foundational work on transdisciplinary inquiry provides essential principles for approaching complex questions with openness, creativity, and relational awareness. However, while Montuori's framework introduces the theoretical underpinnings for transdisciplinary thinking, it stops short of offering a fully applied, practical model. This research advances Montuori's work by visualizing this framework, highlighting previously unseen interdependencies, and creating a structured tool that supports breakthrough innovation. TIM functions as both a conceptual and practical model, bridging epistemological divides through a dynamic, visual representation that invites users to explore relationships among diverse knowledge forms.

TIM emerges as an innovative approach to Informing Science, distinct from traditional models due to its focus on embodied, relational, and non-linear knowledge transfer. Unlike conventional Informing Science frameworks, which often emphasize cognitive processing and linear data flow, TIM synthesizes Western and non-Western epistemologies to catalyze cross-epistemological synthesis. By bridging cognitive insights with sensory and relational experiences, TIM creates a fluid, multi-dimensional approach that allows users to engage with knowledge as a felt, lived experience. This integration of embodied perspectives with ecological and systemic thinking makes TIM a unique contribution to Informing Science, providing an alternative path for insight generation that honors both structured knowledge and intuitive processes.

EXPLORING THE TRANSDISCIPLINARY INFORMING MODEL

The Transdisciplinary Informing Model (TIM) builds on Montuori's (2005, 2012) framework, offering a dynamic, integrative approach to understanding creativity and other complex phenomena. Moving beyond traditional disciplinary boundaries, it unites diverse fields through five interrelated

principles that form TIM's foundation, enabling researchers to approach complexity with a multi-dimensional, relational lens (Table 1).

Table 1. Five core principles of TIM

Principle	Description	Application in practice
Inquiry-Driven Focus	TIM begins with open-ended inquiry, inviting questions that challenge conventional thinking.	Integration of non-Western epistemologies, such as Indigenous philosophies that emphasize relationality, alongside phenomenological perspectives on embodiment.
Cross-Paradigmatic Approach	The model promotes synthesis across paradigms, combining multiple frameworks to uncover intersections.	Comprehensive view of creativity as both an individual and sociocultural process, connecting personal expression with broader social dynamics.
Holistic Thinking	TIM advocates examining phenomena through interconnected lenses – cognitive, emotional, social, and environmental.	Understanding how environmental, sociocultural, and personal factors influence creative expression, revealing creativity's relational nature.
Balancing Rigour with Imagination	TIM demonstrates the synergy between analytical depth and imaginative thinking.	Characterizing creativity as an emergent, relational process that benefits from structured analysis and exploratory perspectives.
Embracing Reflexivity and Creativity	Recognizing the influence of personal positionality and bias on knowledge creation.	Honoring what is beyond immediate understanding, supporting a humble mindset, and receptive to new possibilities.

TIM is a possibilities-driven rather than a problem-solving tool suited for systems in constant flux. While acknowledging interconnectedness, TIM does not aim to predict outcomes but to enable creative discovery and exploration. This framework supports moving beyond "what is" to imagine "what could be" (Glăveanu, 2020), facilitating creative insights through cross-pollination of knowledge and bridging epistemologies for breakthrough ideas (Bohm, 1998; Koestler, 1990; Larocca, 2023). Its purpose is to foster conditions for innovative thought and interdisciplinary collaboration.

The Hexagonal Model Structure

The hexagonal model structure of TIM builds on Montuori's (2005, 2012) principles by visually articulating the interdependencies inherent in transdisciplinary investigations. The hexagon form was chosen for its symbolic strength, adaptability, and interconnectedness, reflecting the model's commitment to integrated knowledge-building. In nature, hexagonal structures such as honeycombs demonstrate resilience and efficient information flow, making this shape an apt metaphor for the model's approach to dynamic inquiry (Figure 1).

This hexagonal model illustrates the evolved Transdisciplinary Informing Framework, building on Montuori's (2005, 2012) principles and extending them by visually representing interdependencies. Each hexagon symbolizes a core principle – curiosity, rigor, and relationality – while overlapping colors emphasize these principles' fluid, interconnected nature, reflecting TIM's systemic, inclusive approach.

The model's hexagonal structure illustrates how core principles – such as curiosity, rigour, imagination, and relationality – interact fluidly and reciprocally. Each hexagon represents an essential component of transdisciplinary inquiry, and the overlapping colors signal the fluid boundaries and interdependencies among them. For example, curiosity often fuels imagination, creating a space for open-

ended exploration, while rigour provides the necessary grounding to contextualize and critically examine insights. The interconnected layout enables users to see how each principle influences and reinforces the others, fostering a cohesive inquiry approach.

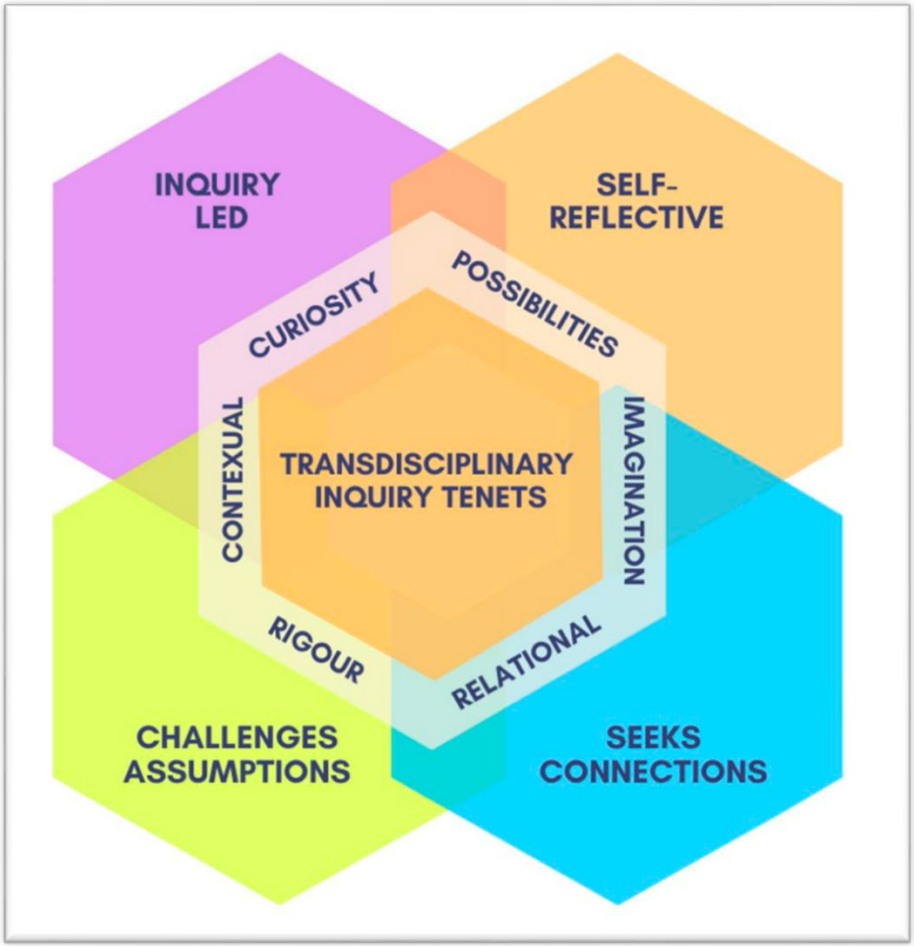

Figure 1. The Transdisciplinary Informing Model

In addition to making interdependencies visible, the hexagonal model incorporates elements beyond traditional disciplinary thinking, aligning with ecological principles found in natural systems. Drawing inspiration from complex communication within superorganisms, the model extends the concept of relationality beyond human perspectives to consider all agents – living, non-living, and imaginal – as potential contributors to the knowledge system. This broader scope reflects TIM's adaptability to diverse contexts and suitability for engaging with complex phenomena.

The hexagonal configuration aligns with the model's emphasis on sensory engagement and systemic communication. Each principle within TIM can be understood as part of a networked structure, where insights generated in one area inform and enhance others. For instance, self-reflection deepens one's capacity for curiosity, while challenging assumptions can stimulate imagination by opening new conceptual spaces. This reciprocal flow of information reflects the model's utility in facilitating creative synthesis across disciplinary boundaries.

Finally, the hexagonal model emphasizes relationships over hierarchies, reflecting the transdisciplinary approach's rejection of rigid boundaries. The hexagonal layout allows each principle to hold equal visual weight, reinforcing that transdisciplinary inquiry thrives on an interconnected approach

to knowledge rather than a linear structure. This egalitarian arrangement supports a vision of inquiry as a collaborative, balanced process in which each principle is vital to the whole.

As an approach grounded in Informing Science, TIM addresses knowledge transfer challenges in transdisciplinary contexts, enabling researchers to navigate complex issues through integrative frameworks. In doing so, TIM aligns with Cohen's (2009) three-environment model by fostering adaptability in information use, synthesis across development contexts, and flexible structures for collaborative knowledge management.

THE SCIENCE AND EPISTEMOLOGY OF TRANSDISCIPLINARY INFORMING

The Transdisciplinary Informing Model (TIM) is grounded in Informing Science principles, which seek to improve knowledge flow across disciplinary and cultural boundaries. TIM builds on Informing Science's emphasis on integrative frameworks by synthesizing insights from diverse epistemologies, incorporating Indigenous thinking, phenomenology, and systems theory. This section examines how these elements contribute to TIM's structure, which supports breakthrough insights by moving beyond conventional cognitive processing.

RELATIONALITY AND NON-WESTERN EPISTEMOLOGIES

TIM is informed by non-Western epistemologies, particularly the concept of relationality, which emphasizes interconnectedness and the importance of relationships over isolated knowledge. This perspective challenges the typical compartmentalization of knowledge and instead fosters a holistic approach, wherein each element is interconnected within a broader web of meaning. By embedding relationality into TIM, the model acknowledges that insights emerge not solely from cognitive processing but through engagement with one's surroundings, interactions, and collective knowledge.

Montuori's (2005, 2012) transdisciplinary framework complements this approach by advocating for open-ended inquiry and embracing knowledge as a relational construct, where diverse perspectives converge to create a richer understanding. Within Cohen's (2009) Information-Using Environment, this relational perspective transforms how information is processed and internalized, moving beyond linear transmission toward a more contextual, interconnected engagement with knowledge.

THE IMAGINAL REALM AND CREATIVE SYNTHESIS

The imaginal realm plays a central role in TIM by fostering non-linear, intuitive, and imaginative ways of knowing. Bohm's (1998) concept of similar differences and his view of science as an imaginative practice resonate here, supporting TIM's possibilities-driven approach to insight generation. This non-cognitive pathway is reinforced by Koestler's (1990) idea of bisociation, where breakthroughs occur by merging previously unrelated ideas.

TIM functions as a catalyst for creative synthesis, encouraging users to engage in processes that transcend logical reasoning and enter into realms of possibility and imagination. Through these imaginative interactions, TIM helps bridge seemingly disparate knowledge systems and catalyze new understandings. This approach aligns with Cohen's (2009) Development Environment, where diverse knowledge forms can be synthesized through creative, non-linear processes that honor both cognitive and imaginative modes of exploration.

EMBODIMENT AND PHENOMENOLOGICAL APPROACHES

TIM's framework is informed by phenomenological approaches, which emphasize the role of embodiment in understanding. This dimension draws from N. Bateson's (2017) concept of warm data, which contextualizes complex systems by focusing on the relational aspects that shape our experiences. Similarly, Claxton's (2015) *Intelligence in the flesh* suggests that cognition is not solely a mental activity but is deeply rooted in bodily experience.

By integrating embodiment into TIM, the model encourages users to engage with knowledge experientially, valuing intuitive, felt understanding as much as analytical thinking. This embodied approach aligns with the Indigenous view of knowledge as felt, lived, and relational, further reinforcing TIM's inclusive epistemological stance. Within Cohen's (2009) management environment, this embodied perspective offers a more holistic approach to knowledge management, recognizing that effective informing.

Systems Theory and Transdisciplinary Integration

TIM's integrative approach is shaped by systems theory and transdisciplinary insights, particularly those articulated by G. Bateson's (1979) patterns that connect. TIM synthesizes these ideas to create a framework that operates as a chaosmos – an ordered complexity where relationships, patterns, and emergent properties coexist dynamically. In this systems-oriented approach, TIM acknowledges the interdependence of diverse epistemologies, fostering a context where the whole is greater than the sum of its parts.

This systems-oriented approach aligns with Montuori's (2005, 2012) transdisciplinary perspective, positioning TIM within a broader ecological and relational framework where knowledge is seen as fluid, interconnected, and always in the process of becoming. This perspective spans all three environments in Cohen's (2009) model, creating a cohesive, integrative approach to informing that recognizes the dynamic, interconnected nature of knowledge creation and transfer.

At its core, TIM represents a significant advancement in finding better ways to inform – the central mission of Informing Science. By integrating cognitive, embodied, relational, and imaginative approaches to knowledge transfer, TIM addresses a critical gap in traditional informing processes, which often privilege analytical and linear modes of understanding. The model's multi-dimensional approach recognizes that effective informing engages the whole person, not just their cognitive faculties, creating pathways for deeper knowledge integration and application. This expanded conception of informing supports Cohen's (2009) vision of Informing Science as a transdisciplinary endeavor that transcends traditional boundaries to create a more holistic understanding.

TIM in Application

The Transdisciplinary Informing Model (TIM) emerged from creative practice as a facilitator, trainer, and experiential designer dedicated to igniting possibilities within diverse contexts. Developed through foundational research exploring creativity from a transdisciplinary perspective, TIM expanded traditional Western epistemologies by incorporating phenomenological and non-Western understandings of knowledge and relationality. This research synthesized practice-based insights, revealing that creativity and insight generation thrive when knowledge is approached both cognitively and as a lived, sensory experience. Through iterative cycles of design and reflection, TIM evolved as a framework for bridging cognitive, embodied, and relational dimensions of knowledge. "Metabolising knowledge" refers to the process by which information is internalised not only intellectually but through sensory, embodied engagement – akin to digesting knowledge through the body and emotions.

To validate TIM's principles in application, Fractals of Nature (Fractals) was developed as a non-traditional research outcome (NTRO) – an immersive, participatory experience designed to test TIM's effectiveness in a real-world setting. This action-oriented, practice-led methodology emphasized engaging participants in direct, immersive experiences where knowledge could be "metabolized" through sensory and embodied actions. Participants' reflections and creative artifacts from Fractals provided data for further refinement of TIM, validating the model as an effective tool for fostering relational insights across diverse contexts.

FRACTALS OF NATURE: CASE STUDY OVERVIEW

Fractals of Nature was designed as an immersive, multisensory event that applied TIM's principles to facilitate knowledge-sharing and cross-epistemological engagement. The project was hosted at the National Art School (NAS) in Sydney, an institution with a rich history of creative experimentation that provided a setting encouraging openness, imaginative thinking, and sensory engagement. The art school environment served as a catalyst for TIM's integration of embodied practice, where participants could experience knowledge as a felt, lived process.

The honeybee served as a central metaphor for Fractals, representing the more-than-human perspectives foundational to TIM. This metaphor extended TIM's framework into an ecological "We-paradigm," inviting participants to consider all agents – human, non-human, and imaginal – as contributors to a shared world. The "We-paradigm" reframes knowledge systems as co-created by diverse agents – human, more-than-human, and imaginal – emphasising interdependence and ethical relationality over individualism. Through the honeybee symbolism, Fractals connected TIM's principles to an embodied awareness of ecological interdependence, encouraging participants to experience themselves as part of an interconnected network.

The event was structured as a 20–30-minute journey through sensory stations that activated TIM's core principles. Approximately 150 attendees – including art students, alumni, community members, and change-makers – participated in the experience, which was designed to embody TIM's Informing Science approach by bridging cognitive understanding with sensory, embodied experience.

IMPLEMENTATION AND DESIGN OF FRACTALS

Fractals of Nature embodied TIM's principles through three key sensory stations, each designed to activate specific aspects of Cohen's (2009) three-environment model of Informing Science and demonstrate new pathways for knowledge transfer (see Table 2).

The stations were designed as a progressive journey from personal reflection to collective creation to ecological connection. At each station, participants engaged in making as a method of metabolizing knowledge, transforming abstract concepts into tangible, felt experiences. This design created an experience that was intellectually stimulating and ethically resonant, as participants entered into an imaginative "We-paradigm" that recognized their interdependence with broader ecological systems.

Table 2. Sensory Station Design and Theoretical Alignment: TIM Principles, Informing Science Environments, and Embodied Knowledge Processes

Station	Sensory focus	TIM principles activated	Connection to Informing Science	Informing process activated
Scent Station	Olfactory	Reflexivity, Imaginative Science	The Scent Station exemplified the Information-Using Environment by transforming abstract memories into embodied knowledge through olfactory engagement. Participants engaged with "nosing and knowing," allowing bespoke scents to trigger memories that were then expressed through watercolor painting.	This station demonstrated how sensory pathways can bypass cognitive barriers to information, creating direct access to stored knowledge and experiences that might remain inaccessible through verbal or textual informing.

Station	Sensory focus	TIM principles activated	Connection to Informing Science	Informing process activated
Touch Station	Tactile	Relationality, Cross-Paradigmatic Synthesis	The Touch Station activated the Development Environment through tactile engagement with beeswax, facilitating knowledge transfer across cultural epistemologies. Participants molded beeswax tiles while listening to Indigenous-inspired stories about interconnectedness.	This station illustrated how physical engagement with materials can facilitate the synthesis of diverse knowledge traditions, creating an embodied understanding of concepts that might remain abstract in conventional informing contexts.
Taste Station	Gustatory	Holistic Thinking, Relational Awareness	The Taste Station demonstrated the Management Environment by connecting individual sensory experiences to broader ecological systems. Participants sampled different honey varieties while considering their ecological origins, then composed reflective "odes to the honeybee."	This station revealed how gustatory experience can create immediate, visceral connections to complex systems knowledge, demonstrating an alternative approach to information management that engages embodied understanding.

Through this emphasis on embodied knowledge creation, Fractals demonstrated how TIM extends Informing Science into experiential territories, catalyzing insights that flow from sensing, creating, and connecting with others. This approach transformed traditional informing processes into multidimensional experiences that engaged participants cognitively, emotionally, and physically.

Results: Artifacts and Evidence of TIM's Effectiveness

The artifacts created during Fractals of Nature provide tangible evidence of TIM's effectiveness in facilitating transdisciplinary informing. The following analysis examines how these artifacts demonstrate the activation of TIM's core principles, evidencing how the model supports knowledge integration across diverse epistemologies.

Evidence of Relational Knowledge Creation

The beeswax wishes, watercolor paintings, and odes to honeybees created by participants demonstrate how TIM fostered relational awareness. For example, one participant's wish stated, "For the health of all beings, may we carry each other with kindness, like bees." This artifact reflects a shift from individualistic thinking to an ecological, relational perspective, connecting personal intentions with broader systems awareness. Similarly, a watercolor painting depicting ocean waves with the annotation "Like the sea to the shore, we shape each other" illustrates TIM's capacity to facilitate relational thinking that encompasses human-environment interactions.

The progression of artifacts shows an evolution from personal association to ecological consciousness, as participants moved through the sensory stations. This evolution validates TIM's effectiveness

in fostering relational knowledge – a key component of transdisciplinary informing that bridges individual perspectives with collective and ecological awareness.

Evidence of Cross-Paradigmatic Synthesis

Artifacts from Fractals demonstrate how TIM facilitated the integration of diverse knowledge systems. Participants' beeswax wishes often combined personal aspirations with ecological awareness and cultural perspectives. For instance, one wish read, "May we honour the wisdom of the bees and listen to the stories they carry," synthesizing Indigenous-inspired ecological respect with personal commitment to relational understanding.

Similarly, the watercolor paintings often merged sensory memory with ecological imagery, as in one participant's depiction of "the creek near my childhood home – where my first lessons on nature were learned." This synthesis of personal memory with environmental appreciation exemplifies TIM's capacity to bridge individual experience with ecological consciousness.

The odes to honeybees particularly demonstrated cross-paradigmatic synthesis, combining scientific understanding with poetic expression. One ode described the bee as "keeper of blossoms, invisible architect of fields, your dance guides us through the web of life," blending biological knowledge with metaphorical appreciation. These artifacts validate TIM's effectiveness in fostering knowledge integration across scientific, cultural, and imaginative paradigms.

Evidence of Embodied Knowledge Processing

The sensory engagement facilitated by Fractals transformed abstract concepts into embodied understanding. Participants' watercolors demonstrate how scent triggered physically expressed memories, with one painting featuring "soft, swirling hues of green and brown" annotated with "This reminds me of the woods near my grandparents' home – a place where I learned to listen." This translation of scent into visual expression exemplifies how TIM's embodied approach facilitates knowledge "metabolization" through sensory channels.

Similarly, the tactile engagement with beeswax allowed participants to physically embed their intentions within a material, as in one wish that read, "May we learn to live gently, like the bees." This wish, inscribed in warmed beeswax, represents the integration of thought and physical action that TIM promotes.

The honey tasting experience further demonstrates embodied knowledge processing, with one ode stating, "You are the sweetness of sun and soil, gathered by tiny wings, woven by flowers." This reflection shows how taste became a pathway to ecological understanding, allowing participants to literally "consume" and internalize knowledge about environmental interdependence.

These artifacts validate TIM's emphasis on embodied knowledge, demonstrating how sensory engagement can facilitate deeper, more integrated understanding than cognitive processing alone. This embodied approach represents a significant contribution to Informing Science, extending traditional models to include somatic, experiential modes of knowledge transfer.

Through the artifacts created at Fractals of Nature, we see clear evidence of TIM's effectiveness in facilitating relational, cross-paradigmatic, and embodied knowledge creation. These results validate TIM as a practical framework for transdisciplinary informing, capable of bridging diverse epistemologies and fostering integrative insights through multisensory, creative engagement.

DISCUSSION AND IMPLICATIONS

The Transdisciplinary Informing Model (TIM) extends traditional knowledge-sharing approaches into embodied, relational, and imaginative domains. Through its application in Fractals of Nature,

TIM demonstrates how transdisciplinary informing can move beyond cognitive-centric models to engage multiple ways of knowing, fostering insights that are simultaneously rigorous, creative, and ethically grounded. This section explores TIM's implications for Informing Science theory and practice.

TIM's Contribution to Informing Science Theory

TIM reimagines the relationship between information, knowledge, and understanding by integrating Western and non-Western epistemologies. This approach creates a framework that acknowledges the multi-dimensional nature of knowledge creation, where insights emerge through logical reasoning, sensory engagement, relational awareness, and imaginative synthesis.

Cohen's (2009) model outlines three interrelated environments critical to informing: the Information-Using Environment, the Development Environment, and the Management Environment. TIM extends this model by illustrating how embodied, sensory, and imaginative engagements transform traditional conceptions of each. For example, rather than focusing solely on information reception, the Information-Using Environment in TIM includes sensory pathways that enable metabolised understanding. Table 3 illustrates how TIM's approach extends and transforms each of Cohen's (2009) three environments, moving from traditional informing approaches to embodied, interconnected methodologies.

TIM Aligned with Cohen's Three Environments of Informing Science

TIM's integration of embodied knowledge transforms how we understand the Information-Using Environment, demonstrating that effective informing engages users through multiple sensory and experiential channels. The Fractals project illustrated how participants could engage with complex ecological and relational concepts through direct sensory experiences, leading to a deeper, more integrated understanding than might be achieved through conventional information transfer alone.

Table 3. TIM's Extension of Cohen's (2009) Three-Environment Model: From Traditional to Embodied Informing Approaches

Cohen's environment	Traditional approach	TIM's extension	Implications for Informing Science
Information-Using Environment	Cognitive focus on information reception and processing	Embodied, sensory engagement as pathways to knowledge internalization	Expands understanding of how users engage with and internalize information beyond cognitive channels
Development Environment	Disciplinary approaches to knowledge creation	Cross-paradigmatic synthesis of diverse epistemologies	Creates new possibilities for innovation by integrating multiple knowledge traditions in knowledge development
Management Environment	Hierarchical, linear information structures	Hexagonal, interconnected organization of principles	Provides a template for managing complex, transdisciplinary information flows that acknowledge interdependence

Within the Development Environment, TIM's cross-paradigmatic approach demonstrates how diverse epistemologies can be synthesized to create new insights. By bringing together Indigenous relationality, phenomenological embodiment, and systems thinking, TIM offers a model for how Informing Science can engage with multiple knowledge traditions, fostering a more inclusive approach to understanding complex phenomena.

In the Management Environment, TIM's hexagonal structure visualizes interdependencies among different principles, illustrating how the relational, reflexive, and imaginative aspects of knowledge can be coordinated within a cohesive framework. This visual model provides a template for structuring information flow in ways that acknowledge the fluid, interconnected nature of transdisciplinary knowledge.

Practical Applications and Future Directions

The successful implementation of TIM in Fractals of Nature suggests several potential applications across diverse fields:

- **Educational Applications:** TIM provides a framework for designing transdisciplinary educational experiences that engage students through multiple sensory and cognitive pathways. By incorporating embodied, relational, and imaginative elements into curriculum design, educators could create more engaging learning experiences that foster deeper understanding of complex concepts. For example, environmental education could use TIM-inspired approaches to connect scientific knowledge with embodied experiences in nature, fostering a more holistic ecological awareness.
- **Organizational Learning:** In organizational contexts, TIM offers a structure for facilitating knowledge-sharing across departments and disciplines. Workshops inspired by the Fractals model could help teams break out of siloed thinking and develop more creative approaches to complex challenges. For instance, a healthcare organization might use TIM to bring together clinical, administrative, and patient perspectives, creating more integrated approaches to care delivery.
- **Sustainability Initiatives:** TIM's emphasis on relationality and ecological sensitivity makes it particularly relevant for environmental projects. TIM could support more holistic approaches to sustainability challenges by fostering embodied understanding of interconnectedness. For example, a community-based climate adaptation project might use TIM to integrate scientific data with local knowledge and experiential understanding of ecological changes.
- **Arts-Based Research:** The success of Fractals suggests that TIM provides a valuable framework for arts-based research methodologies. Researchers could use TIM to design creative, sensory-based investigations of complex phenomena, generating insights that might not emerge through traditional research methods. For example, a study of community resilience might use TIM-inspired creative practices to explore how communities experience and respond to change.
- Future research should explore these applications in greater depth, examining how TIM might be adapted to specific contexts. Additionally, researchers could investigate the long-term impacts of TIM-based interventions, assessing whether insights generated through embodied, relational engagement lead to lasting shifts in understanding and behavior. Finally, research could explore combinations of TIM with other informing frameworks, creating hybrid approaches that leverage multiple models' strengths.

Conclusion

The Transdisciplinary Informing Model (TIM) offers an innovative framework for bridging diverse epistemologies and catalyzing breakthrough thinking in complex contexts. By visualizing and extending Montuori's principles of transdisciplinary inquiry, TIM creates a structured yet flexible approach to knowledge-sharing that honors the interconnected, relational nature of complex systems. The model's integration of Western and non-Western perspectives, embodied knowledge, and imaginative

science significantly contributes to Informing Science, expanding our understanding of how knowledge flows across disciplinary boundaries.

TIM advances the transdiscipline of Informing Science by addressing its fundamental mission – finding better ways to inform – through a multi-dimensional approach that recognizes the limitations of purely cognitive informing processes. By demonstrating how sensory engagement, relational awareness, and imaginative synthesis can facilitate deeper, more integrated understanding, TIM expands the repertoire of informing techniques available to researchers and practitioners across diverse fields.

The application of TIM in Fractals of Nature demonstrates its potential as a practical tool for fostering deep, relational insights through sensory engagement and creative expression. By enabling participants to experience knowledge as a lived, embodied process, TIM facilitates understanding that transcends cognitive processing alone, engaging the whole person in the act of knowing. This approach has implications for designing informing systems across various contexts, suggesting the value of incorporating sensory, relational, and imaginative elements into knowledge transfer approaches.

While TIM offers significant advantages for transdisciplinary informing, it is important to acknowledge potential limitations. The model requires facilitators skilled in creating embodied, sensory experiences, and its application may be challenging in environments resistant to non-traditional approaches to knowledge-sharing. Additionally, further research is needed to assess TIM's effectiveness across diverse cultural contexts and to develop metrics for evaluating its impact on knowledge transfer and innovation.

By integrating sensory, relational, and cognitive dimensions of knowledge transfer, the Transdisciplinary Informing Model reimagines Informing Science as an embodied, ethical, and systems-aware practice. In doing so, TIM extends the discipline beyond cognitive frameworks, enabling richer, more inclusive forms of informing that catalyse creativity, collaboration, and transformation in diverse settings.

As we face increasingly complex challenges in fields ranging from education to environmental sustainability, models like TIM become essential for navigating complexity and fostering collaborative, integrative solutions. By providing a framework that respects multiple ways of knowing and encourages creative synthesis of diverse perspectives, TIM offers a pathway toward more holistic approaches to informing across disciplines and cultures. Through further research and application, TIM has the potential to transform how we understand and practice the art of informing, creating new possibilities for breakthrough innovation in an interconnected world.

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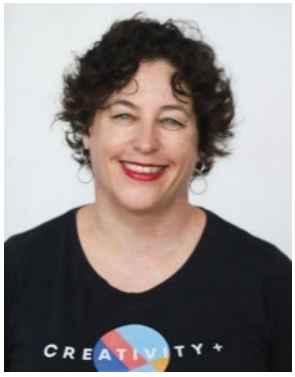

Paulina Larocca is a transdisciplinary researcher, educator, and creative practitioner whose work explores the intersection of somatic creativity, ethical collaboration, and systems thinking. She has completed her PhD at the University of Technology Sydney (UTS) and is currently awaiting formal conferral. Her research investigates embodied, practice-led approaches to deferring judgement and their role in fostering relational and ecological creativity.

Paulina is a casual academic at the UTS TD (Transdisciplinary) School, where she teaches into the Bachelor of Creative Intelligence and Innovation and the Diploma of Innovation. She is also an award-nominated course designer and facilitator, known for leading immersive pedagogical experiences that blend creative theory with lived inquiry. Her recent project, *Fractals of Nature*, is a non-traditional research output and case study in embodied knowledge transfer, contributing to emerging conversations in Informing Science and transdisciplinary research. Alongside her academic practice, Paulina brings over 20 years' experience as a global innovation director and continues to consult across sectors on creativity and transformation. Further information about her work is available at www.paulinalarocca.com.