LAPIN YLIOPISTO
UNIVERSITY OF LAPLAND

Chaynika Gujela

Integrating Eco-centric Perspective in Service Design Education

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Author: Chaynika Gujela

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ABSTRACT

Service design education operates from a foundational anthropocentric assumption, that humans are the central participants in any design process. This shapes what tools students learn, who counts as a stakeholder, and how success is defined, leaving the living world structurally absent from design processes. While growing recognition of ecological crisis has prompted calls for design education to shift beyond this paradigm, the pedagogical conditions through which an ecological orientation might be cultivated in learners remain largely unaddressed in service design education specifically.

This research develops guiding principles for integrating eco-centric perspectives into service design education through three interconnected research questions: what eco-centric pedagogical approaches exist that could inform Service Design teaching (RQ1), what challenges and gaps SD educators face in integrating these perspectives (RQ2), and what guiding principles can support this integration (RQ3).

A qualitative, interpretivist study was conducted through semi-structured interviews with seven participants: four service design educators from European higher education institutions and three educators working with eco-centric pedagogical approaches across Brazil, Canada, and Kenya. Data were analysed using reflexive thematic analysis (Braun & Clarke, 2006).

RQ1 findings identified six themes across eco-centric educator accounts, centring on place as active teacher, embodied and material knowing, slowness and cyclical duration, relational learning, reciprocity, and positionality. RQ2 findings established that the gap in SD education is structural sustained by business partner logic, semester timelines, and the absence of pedagogical infrastructure for ecological integration.

From the synthesis of both sets of findings, four guiding principles emerged: Relational Thinking, Place as Teacher, Embodied and Sensory Learning, and Cyclical Reciprocity, constituting a pedagogical orientation grounded in relational ontology.

Keywords: service design education, eco-centric pedagogy, more-than-human design, relational ontology, guiding principles, anthropocentrism

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ABBREVIATIONS

SD - Service Design
EC - Eco-centric educator (as used in participant codes EC1, EC2, EC3)
HCD - Human-Centred Design
MOVA - More-than-Human Values (framework by Nilsson et al., 2025)
SDGs - Sustainable Development Goals
SDSI - Service Design Strategies and Innovation (the Erasmus Mundus program)
RQ - Research Question
UNESCO - United Nations Educational, Scientific and Cultural Organization
IPCC - Intergovernmental Panel on Climate Change
NGO- Non-Governmental Organisation

1. INTRODUCTION

1.1 Background of the Research

Emerging from its roots in marketing and business strategy, and its current application across public services, healthcare, and urban planning, Service Design(SD) education has become a discipline that centres on improving human experience through systematic, user-focused approaches (Mukhopadhyay and Ray, 2025). With the expanding scope of service designers' capabilities to tackle social justice, public policy, and climate emergency, the shift toward sustainability and social impact has brought growing recognition that services don't operate in isolation, they depend on and affect the living systems (Jung and Mejía, 2023). Yet the methods remain unchanged, and students still learn frameworks that treat nature as an optional context rather than an essential partner. Beneath the SD methods and tools lies a deeper foundation, an anthropocentric worldview that positions humans as separate from and above nature (St. Pierre, 2015).

This anthropocentric foundation runs through every aspect of service design pedagogy. It defines who counts as stakeholders, where and how learning happens, which oftentimes also ends up neglecting the impact of services on the ecological system.

The consequences of this paradigm extend far beyond design education. The impact of human influence on climate systems is evident more than ever before. The global ecological crises noted by global warming, biodiversity loss, frequent droughts, wildfires and extreme rainfall are happening faster than scientists previously expected. These are not just environmental problems, but fundamentally a crisis of human-designed systems (Eyring et al., 2021). However, design education continues to position ecological elements as resources or background.

When the very systems designed by humans, operating on an anthropocentric mindset, are causing ecological collapse, then the paradigm itself needs to be examined. As UNESCO's 2021 report acknowledged, "If being educated means living unsustainably, we need to calibrate our notion of what education should do and what it means to be educated" (UNESCO, 2021, p. 33).

In this context, Service design education becomes a key site for this shift to move beyond this ideology and towards more regenerative ways of thinking and designing.

An eco-centric perspective offers a fundamentally different way of thinking and being. It recognises that humans are part of the bigger ecosystem, the intrinsic value of nature, prioritising the health of entire ecosystems over human interests (Kopnina, 2019).

Eco-centric pedagogical approaches outside service design offers a model for reconnection. Place-based education positions land and communities as teachers, with knowledge emerging from sustained engagement with living systems (Lynch & Mannion, 2021). Embodied learning emphasises knowledge through senses and materials, with understanding emerging from direct bodily engagement (Häggström, 2019). Relational and ecological learning teaches students to understand interconnection, patterns, and cycles within living systems (Gravett et al., 2024; St. Pierre, 2015). While these approaches demonstrate what becomes possible when the learning process is interconnected with the living system, they haven't been systematically translated into service design education. Calls emerge for design education to include relational, long-term thinking within complex social-ecological systems (Beatrice, 2025; Čaić M et al., 2025; Ceschin & Gaziulusoy, 2016).

This research explores how ecocentric perspectives can be integrated into service design education. It examines what paradigm shift looks like in practice: what approaches from ecocentric education could inform service design teaching, what gaps exist in service design pedagogy, and how these insights can translate into concrete guiding principles.

1.2 Research Motivation

This research emerges from the intersection of multiple experiences. With an undergraduate background in Plant Sciences and biotechnology, I spent 4 years studying how living systems function, the intricate relationship between soil microorganisms and plant roots, the chemical and physical signals plants use to communicate stress, and the cycles through which nutrients move through ecosystems.

This experience was further shaped through my professional experience working with NGOs across education and sustainability projects. In these contexts, ecological and social systems were not separate, and questions of access, livelihood, and education were deeply tied to land, resources, and environmental conditions. This made the interdependence between human systems and living ecosystems more tangible in practice.

However, through my training in Service design, strategies and innovation, I learned frameworks that centred on human needs and value creation. Stakeholder maps included users, providers, businesses, policymakers, but not the river that provides water for the service, the soil communities that get affected by the material choices, or the pollinators whose habitats the service might disrupt. The tension between these ways of knowing and working became difficult to ignore.

The research is grounded in a growing tension between how service design is taught and the ecological realities we are living through. Climate change and biodiversity loss are no longer future concerns, they are unfolding rapidly today in the present and every day. However, service design education continues to operate as if human needs can be addressed independently of ecological health.

This research is motivated by the belief that service design education must move beyond this paradigm, as a fundamental shift in how designers are trained to think and act. If service designers are shaping systems that influence societies, then education becomes a critical space for change. The focus, therefore, is not only on why this shift is needed, but on how it can be enacted. What can be learned from eco-centric approaches that have long maintained connection to living systems?

Situated in Rovaniemi, near the Arctic Circle, adds another layer of context and urgency to these questions. Seasonal changes, fragile ecosystems, and the accelerated impact of climate change in northern regions are immediate and visible. Conducted at the University of Lapland, this study aims to develop guiding principles that can support a shift in service design education.

1.3 Research goals and Research questions

The primary goal of this research is to develop guiding principles for integrating eco-centric perspectives into service design education. These principles aim to support educators seeking to shift from anthropocentric to eco-centric pedagogy, grounded in approaches followed by practitioners who are integrating eco-centric methods and what service design educators identify as missing.

To achieve this, the research addresses three interconnected questions:

- RQ1: What eco-centric pedagogical approaches exist that could inform service design education?
- RQ2: What challenges and gaps do service design educators face in integrating an eco-centric perspective into their teaching?
- RQ3: What guiding principles can support the integration of an eco-centric perspective in service design education?

Together, these questions build towards a synthesis. RQ1 examines existing approaches that maintain connection to living systems, while RQ2 identifies specific gaps and challenges in current SD pedagogy. RQ3 brings these insights together, synthesising findings from eco-centric education and service design education into concrete principles that educators can implement.

1.4 Research Scope and Research Limitations

This research focuses on service education rather than professional practice. It examines how educators teach, how students learn and how institutional structures shape pedagogy. The guiding principles developed are intended to support educators in designing curricula, selecting methods, and assessing learning.

The study draws primarily from European SD programs, shaped by both the concentration of such programs and the researcher’s access through the Erasmus Mundus context. It is based on seven semi-structured interviews: 4 with SD educators and 3 with educators working with eco-centric approaches. While these provide valuable insights, the sample is limited and doesn’t capture the full diversity of global perspectives, particularly where SD is emerging in different ecological and cultural contexts.

The ecocentric approaches explored, such as Place-based learning, Embodied learning, and relational and ecological learning, were selected for their relevance to gaps identified in SD education. However, they do not represent the full range of ecocentric pedagogies, and additional perspectives may extend or challenge the findings presented here. The resulting guiding principles are a synthesis of these specific inputs. They offer structured direction, but are not universally applicable without adaptation. Their implementation will depend on local contexts, institutional constraints, and available resources.

And finally, this research develops guiding principles rather than fully designed curricula. Their value lies in how they are translated into practice, through content, learning, experience, and assessment. This study provides a foundation, while further work is needed to explore how these principles can be applied across different educational settings.

1.5 Thesis Structure and Overview

This introductory chapter has outlined the background of the study, set the context for the research, and highlighted its significance. It has also reflected on my motivation as a researcher and presented the research objectives and questions. In addition, the scope, limitations, and ethical considerations of the study have been discussed.

The second chapter provides the theoretical background, examining current service design education practices alongside ecocentric pedagogical approaches that inform this research. It establishes the landscape, how SD education operates, what ecocentric approaches exist and where these perspectives intersect.

Chapter three outlines the research methodology, detailing the qualitative approach, interview-based data collection with seven educators, participant selection and thematic analysis used to identify patterns across ecocentric and SD contexts.

Chapter four presents the findings, organised by research question. It first explores pedagogical approaches in ecocentric education (RQ1), then identifies gaps and challenges in SD education (RQ2), and concludes with a synthesis showing how these insights inform the principle's foundational logic (RQ3).

In chapter five, the four guiding principles for integrating an ecocentric perspective into service design education are introduced. Each principle includes theoretical grounding, practical strategies for implementation, and guiding questions for educators.

Finally, chapter 6 reflects on the principles' contribution to SD education, its practical implications, limitations and directions for future research. The thesis concludes by considering how these principles might support a shift from anthropocentric to ecocentric design pedagogy.

1.6 Ethical Considerations

All participants provided informed consent prior to the interviews. They were made aware that participation was voluntary, with the option to decline any question or withdraw from the study at any time without explanation. Participants agreed to the recording of their interviews and were informed that their responses would be anonymised in all research outputs. They also consented to the secure storage of recordings in accordance with the Data Protection Act (1050/2018), and to the use of anonymised data for relevant future research.

This research also required careful consideration of how ecocentric knowledge systems are engaged. While I bring a background in plant sciences, I have not explored many of the eco-centric pedagogical approaches. I therefore approach this work with awareness of my positionality. The principles do not claim authority over culturally specific knowledge systems, instead it draws from insights shared by educators and practitioners.

2. LITERATURE REVIEW

Paying attention to suffering sharpens our ability to respond. To be responsible. This, too, is a gift, for when we fall in love with the living world, we cannot be bystanders to its destruction. Attention becomes intention, which coalesces itself to action. - Robin Kimmerer, Returning the Gift (Kimmerer, 2014, p20)

This literature review brings together three interconnected areas that shape this research. It begins by looking at service design education as it currently exists, particularly its strong human-centered orientation, and uses Bai et al.'s (2009) framework of three axes of disconnection to understand how this is reinforced. It then turns to ecocentric pedagogical approaches that respond to these disconnections. Finally, it explores where these two areas meet and where they don't, highlighting the gap this research aims to address.

2.1 Service Design Education: Current Landscape

2.1.1 Evolution and pedagogical approaches

Service design emerged as a distinct discipline in the early 1980s, though its intellectual foundation lies in marketing and business strategy. Lynn Shostack, a Citibank executive, introduced the term "Service Design" in 1982, proposing systematic design of both material and immaterial components of service offerings (Shostack, 1982). This marketing-focused origin positioned service design initially as a tool for enhancing customer satisfaction and competitive advantage within service-based economies (Mukhopadhyay & Ray, 2025). As Service economies expanded, the discipline evolved beyond its business roots, drawing from interaction design, systems thinking, and user experience design to develop its own methods and theoretical frameworks (Polaine et. al., 2013)

By the early 2000s, service design had evolved into a recognised field of practice and education. The establishment of dedicated service design consultancies: Livework in London (2001) and Engine (2003), alongside academic programs such as Köln International School of Design's Service Design department, marked this disciplinary consolidation (Sangiorgi & Prendiville, 2017). Today, service design education spans diverse contexts, from master's programs in Europe, America, and Asia to professional development courses for industry practitioners, addressing challenges ranging from public sector services to digital transformation (Ding et al., 2023)

The pedagogical foundation for SD education derives significantly from marketing and industrial design traditions, particularly the studio-based learning model (Mejía et al., 2025). Studio-based learning model emphasises learning by doing within collaborative physical or digital spaces where students work on design projects under faculty guidance (Abdullah et al., 2011). In SD contexts, studio pedagogy manifests through several characteristic features, project work as the primary learning vehicle, periodic design critiques, iterative prototyping and public presentation of outcomes (Thorpe et al., 2016).

Project-based learning structures most service design education, with students typically working on real and simulated design briefs over semester-long timelines (Yu et al., 2021). These projects often involve partnership with external organisations like businesses, public institutions, or community groups, providing students with authentic contexts for applying SD methods (Lima et al., 2012). Faculty act less as lecturers and more as facilitators or “master designers”, circulating among student teams to provide critique and guidance (Mejía et al., 2025). This pedagogical model emphasises practical skill development in research, ideation, prototyping and stakeholder engagement rather than theoretical knowledge transmission.

However, studio-based approaches also embed certain limitations. Design studios, though collaborative spaces, often remain physically and conceptually separated from the living systems and ecosystems that services ultimately impact. Research for projects typically occurs through secondary sources, stakeholder interviews, and observational methods rather than sustained engagement with places, territories, or more-than-human communities (Jung and Mejía, 2023). The simulated nature of many projects can isolate learning from realities of everyday life and professional practice, creating a gap between educational exercises and the complex socio-ecological contexts in which services actually function (St. Pierre & Blenkinsop, 2025).

2.1.2 Human-Centred Design Dominance

Contemporary SD education operates predominantly from a human-centred design paradigm. This approach positions humans, typically conceptualised as ‘users’, ‘customers’, or ‘stakeholders’, at the centre of the design process (Brown, 2008). Human-centred design emphasises empathy building through qualitative research methods, iterative prototyping informed by user feedback and solutions developed to meet explicitly human needs and experiences (Stickdorn et al., 2018).

In educational contexts, human-centred design manifests through specific pedagogical emphases on teaching methods that focus on human behaviours and experiences, developing personas and journey maps as primary sense-making tools and evaluating design primarily through impact on human users (Norman & Verganti, 2014). Stakeholder mapping exercises, a common pedagogical tool, typically centre on identifying human actors within service systems - users, employees, managers, policymakers, while ecosystems, non-human species, and living systems rarely appear as stakeholders with their own agency or interests (Sangiorgi, 2009).

This anthropocentric foundation shapes not only what service designers learn to notice, but how they learn to define problems and evaluate solutions. Design challenges are framed in terms of human needs, pain points or aspirations. Success criteria focus on user satisfaction, organisational efficiency, or business viability. The more-than-human world - when considered at all, typically appears as “context”, “environment” or “sustainability constraint” rather than as partner, participant or central consideration.

2.1.3 Sustainability Integration: Challenges and Structural Barriers

Recognition of the ecological crisis has prompted growing efforts to integrate sustainability into SD education, yet these attempts remain constrained by persistent structural patterns that reinforce anthropocentric orientations. While some programs now incorporate sustainability-focused modules or elective courses addressing topics such as circular economy and design for social innovation (Ceschin & Gaziulusoy, 2016), sustainability often appears as an optional add-on rather than a fundamental reorientation, a topic addressed in specific projects rather than woven throughout pedagogical practice (Jung and Mejía, 2023). When sustainability is addressed, it frequently remains anthropocentric in framing, focusing on "reducing environmental impact" or "sustainable services for humans" rather than questioning the human-centred paradigm itself (Čaić et al., 2025).

Several structural characteristics create what might be termed "pedagogical path dependencies" that make eco-centric integration particularly challenging. First, the reliance on external partnerships, often with business or public sector organisations, means that project scopes and success criteria are typically defined by organisational rather than ecological imperatives (Nilsson et al., 2024). Partners seek solutions to human-centred problems: improving customer experience, increasing efficiency, and enhancing employee engagement.

Assessment frameworks developed for human-centred design struggle to evaluate eco-centric outcomes (Ding et al., 2023). Existing evaluation criteria, clarity of problem definition, rigour of user research, feasibility of proposed solution, and quality of prototypes, all implicitly reinforce human-centred thinking. How does one grade a project that prioritises ecosystem health over user satisfaction? Without transformed assessment practices, even well-intentioned sustainability integration risks remaining superficial.

This also creates a disconnect between stated sustainability commitments and enacted pedagogical practice, a gap that calls for more fundamental pedagogical transformation rather than curricular addition (Beatrice, 2025). Breaking these self-reinforcing patterns requires not merely adding sustainability content, but fundamentally reconsidering how service design education operates.

2.2 Theoretical Framework

Modern education systems did not emerge naturally from community needs but were deliberately designed to serve industrial economies. Tyack (1974) documents how the centralisation and standardisation of education accompanied industrialisation, transforming localised community learning into bureaucratized systems structured to "train efficient and disciplined labourers who could perform work in a structured, linear manner and within an established hierarchy" (Lozjanin et. al., 2025, p.67). This industrial model of education carries profound consequences for how students learn to relate to their bodies, to the natural world, and to each other.

2.2.1 The three axes of Disconnection

Bai et al. (2009) provide a theoretical framework for understanding how contemporary education perpetuates ecological crises through what they term "three axes of disconnection": disconnection from body, from world/nature, and from each other. Writing from the perspective of contemplative pedagogy, they argue that conventional schooling operates through "a certain mood and mode of consciousness that precariously holds up the colossal edifice of modern industrial civilisation" (Bai et al., 2009, p. 320). This framework, while developed for teacher education, offers particular resonance for understanding design pedagogy.

- Disconnection from Body: The Objectification of Embodied Experience:

  The first axis concerns what Bai et al. describe as objectification of the body. "We treat our (and others') bodies as if they were objects we can push around, punish and reward, neglect, or manipulate to get certain results, be they the docile student body, drug-treated patient body, surgically improved glamorous body, or muscular athletic body" (Bai et al., 2009, p. 320). This stems from what they identify as "the fundamental level of objectification that our dominant civilization, with its millennia! legacy of mind-body and intellect-matter dualism, has culturally inscribed into us" (Bai et al., 2009, p. 320).

  This critique finds parallels in design education scholarship. Dutton's influential 1987 analysis introduces the concept of "hidden curriculum" to studio pedagogy, defined as "unstated values, attitudes, and norms which stem tacitly from the social relations of the school and classroom" (Dutton, 1987, p. 16). His work shows how unequal power relations are reinforced in educational spaces, including design studios, through both physical setups and social structures that prioritise abstract thinking over embodied ways of knowing (Dutton, 1987).

  Imrie (2003) extends this critique specifically to architecture, arguing that design education produces graduates who lack what he terms "embodied architectural practice" (Imrie, 2003). The embodied cognition movement offers a theoretical counterpoint.

Learning is understood as emerging through direct engagement with environments, through movement, interaction, and relationships with both human and non-human elements (Biggs et al, 2024; Mikaels & Asfeldt, 2017).

Rather than separating the learner from the world, these approaches highlight how understanding develops through lived, sensory experiences within interconnected systems. This positions learning not as abstract cognition, but as something grounded in ongoing relationships with place and the more-than-human world (Park et. al., 2022). Yet despite this theoretical promise, such embodied, relational approaches remain marginal in design curricula, where cognitive-visual modes continue to dominate studio practice.

- Disconnection from World/Nature: Subject-Object Dualism

Bai et al.'s second axis involves "the perceptual and sensuous disconnect whereby we perceive the world to be categorically separate from oneself" (Bai et al., 2009, p. 320). This subject-object dualism, they argue, produces the conviction that "we humans are entitled to treat the world as our resources and consumable goods: 'We can do whatever damn thing we want to the world!'" (Bai et al., 2009, p. 320). What disappears in objectified consciousness is "interbeing, the sense that we, rocks, rivers, trees, toads, and humans are one flowing, interpenetrating stream of being that embraces and connects every being and its associated sensibilities of belongingness, compassion, care, love, and gratitude" (Bai et al., 2009, p. 320).

Design scholarship increasingly challenges this anthropocentrism. Findeli argued over two decades ago that design education "must exceed what design is today" and that academies have a "responsibility to imagine the future profile of our professions" (Findeli, 2001).

Kopnina's analysis of UN sustainable development goals reveals how even ecological approaches often maintain instrumental relationships with nature, positioning the environment as a means to human ends rather than worthy of intrinsic consideration (Kopnina, 2019).

- Disconnection from Each Other: Instrumental Relationships

> The third axis concerns interpersonal relationships characterised by instrumental rather than intrinsic regard. Bai et al. describe this as "not knowing how to connect as heart-full and soul-full beings having intrinsic worth" (Bai et al., 2009, p. 321). When people relate to each other "out of the instrumental interest of gaining some ends, be they good grades, work performance evaluations, or recognition and acceptance, intersubjectivity is missing. Human relationships become, even if professionally or interpersonally 'nice' and 'smooth,' fundamentally instrumental" (Bai et al., 2009, p. 321).
>
> Dutton's analysis of studio pedagogy grounds this critique by showing how design education reflects broader societal power structures. He argues that both what is taught and how knowledge is distributed are shaped by existing power dynamics (Dutton, 1987). This resonates with Freire's (1970) critique of the "banking model" of education, where students become objects to be filled with knowledge rather than subjects engaged in dialogue.

Across all three axes, Bai et al. identify a common mechanism: education continually directs attention outward toward "abstract and discursive knowledge (information, fact, theories, ideas)" rather than inward toward embodied, lived experience (Bai et al., 2009, p. 324). Students are "frequently interrupted from whatever they are feeling, sensing, and musing and often are not given any opportunity to indwell deeply in their own being and becoming" (Bai et al., 2009, p. 325). Teachers demand attention; bells demand obedience to time; textbooks demand focus on information (Bai et al., 2009, p. 325). The result is "alienated consciousness", existentially insecure, perpetually anxious, unable to experience wholeness (Bai et al., 2009, p. 325).

2.2.2 Manifestations in Service Design Pedagogy

These disconnections manifest with particular intensity in service design education, where the discipline's business origins (see Section 2.1) combine with studio structures to create multiple, overlapping separations from living systems.

- Perpetuating Body Disconnection: Service design pedagogy privileges visual representation, journey maps, service blueprints, and system diagrams over embodied engagement. As Bai et al. observe of education generally, students' bodies become objects managed for productivity rather than sites of knowing: "we mostly think in terms of what we can do to our bodies for certain results" (Bai et al., 2009, p. 320). In studios, this manifests through hours of sedentary work at computers and desks.

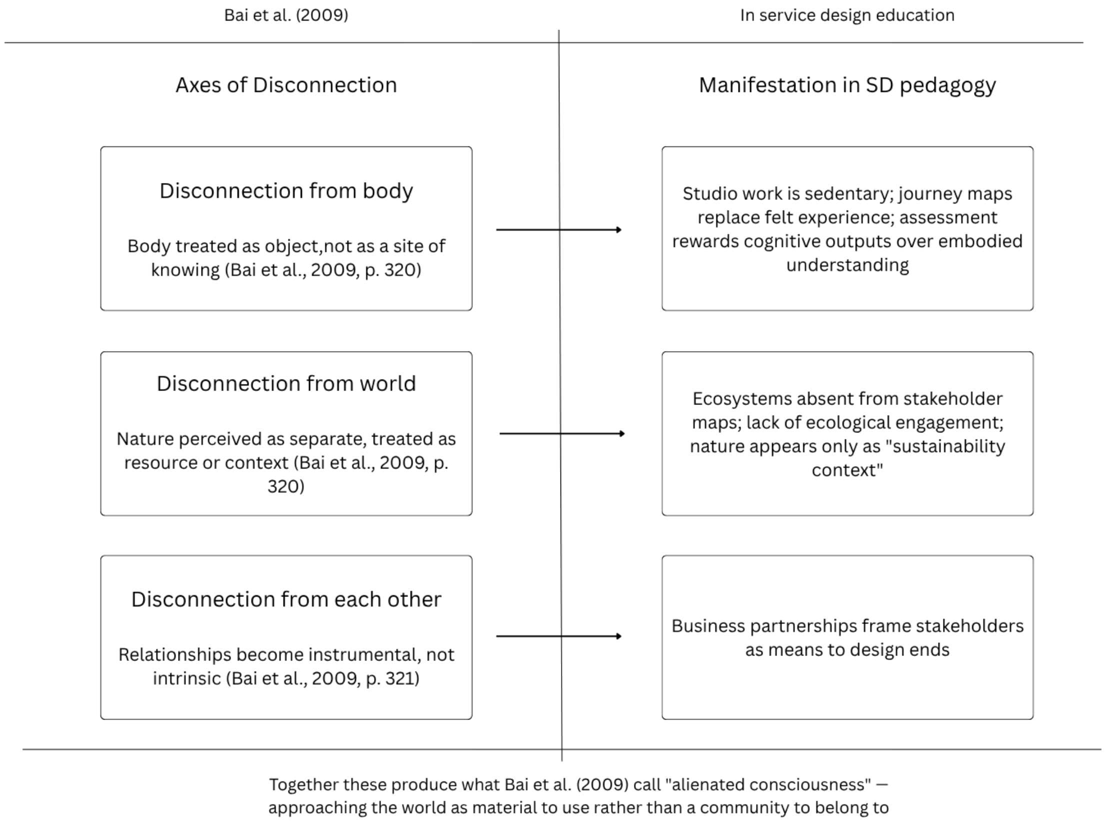
Assessment structures reinforce this pattern by evaluating cognitive outputs rather than embodied understanding (Nilsson et al., 2024). Dutton suggests that studio environments often reflect the hierarchical structures found in contemporary workplaces (Dutton, 1987). A student might design public transportation without experiencing the fatigue of long commutes or the stress of missed connections.

- Perpetuating Nature Disconnection: The disconnection from world/nature manifests in service design's systematic exclusion of ecosystems from design consideration (see Section 2.1). Methods taught empathy mapping, journey mapping, stakeholder analysis, and position only humans as subjects of design inquiry, precisely mirroring what Bai et al. describe: treating "the world as our resources and consumable goods" (Bai et al., 2009, p. 320).

  Semester-based timelines amplify this disconnection. Project cycles prevent students from experiencing what Bai et al. call the "flowing, interpenetrating stream of being" (Bai et al., 2009, p. 320) that emerges through sustained engagement with place across seasonal changes **(**Biggs et al, 2024).

- Perpetuating Instrumental Relationships: Business partnership models permeate service design education with instrumentality. External organisations seek human-centred solutions, improved customer experience, increased revenue, and training students to relate to "stakeholders" extractively. Dutton would recognise this as a hidden curriculum: knowledge serving power rather than mutual flourishing (Dutton, 1987).

  Moreover, human-human instrumentality creates a conceptual foundation for extreme instrumentality toward non-human life. When students learn to relate to other humans primarily as means to design ends, they have no framework for relating to ecosystems except as resources.



Bai et al. (2009)	In service design education
Axes of Disconnection	**Manifestation in SD pedagogy**
Disconnection from body Body treated as object,not as a site of knowing (Bai et al., 2009, p. 320)	Studio work is sedentary; journey maps replace felt experience; assessment rewards cognitive outputs over embodied understanding
Disconnection from world Nature perceived as separate, treated as resource or context (Bai et al., 2009, p. 320)	Ecosystems absent from stakeholder maps; lack of ecological engagement; nature appears only as "sustainability context"
Disconnection from each other Relationships become instrumental, not intrinsic (Bai et al., 2009, p. 321)	Business partnerships frame stakeholders as means to design ends

Together these produce what Bai et al. (2009) call "alienated consciousness" — approaching the world as material to use rather than a community to belong to

Figure 1: *Three axes of disconnection (Bai et al., 2009) and their manifestations in service design education. Each axis describes a mode of separation produced by conventional schooling; the right column shows how this separation operates specifically within SD pedagogical structures.*

Cumulative Effects

These three disconnections produce what might be termed "extractive consciousness", approaching the world as material to use rather than a community to which one belongs. Bai et al.'s framework suggests that healing these disconnections requires pedagogies that reconnect students with embodied knowing, living places, and relationships characterised by intrinsic rather than instrumental regard. Section 2.3 examines such pedagogies.

2.3 Eco-Centric Pedagogies: Reconnection Through Learning

This section explores three eco-centric pedagogical approaches that address the Bai. et al.'s three axes of disconnection in relation to SD education. Embodied learning, place-based learning, and relational and ecological learning are not simply teaching methods; they are grounded in an entirely different understanding of what knowing is, where it happens, and who or what it involves. Together, they offer a foundation for rethinking how eco-centric perspectives can be cultivated, not just communicated, in educational settings.

2.3.1 Relational Ontology as Foundation

Before examining each pedagogy on its own terms, it is worth naming what all three share at a deeper level: a commitment to relational ontology. In conventional Western educational frameworks, knowledge is typically understood as something an individual mind acquires, a transfer of information from teacher or text to student. Learners are positioned as separate from the world they are learning about. This separation mirrors the broader Cartesian split between mind and body, human and nature, observer and observed, that underlies much of modern Western thought (Barad, 2006; Haraway, 1988).

Relational ontology offers a different starting point. It holds that beings, human and non-human, do not exist as fixed, independent entities who then enter into relationships. Rather, they come into being through relationships. Identity, meaning, and knowledge are all understood as emerging from encounters, entanglements, and ongoing processes of exchange (Gravett et al., 2024). This philosophical position has direct implications for how learning is understood. If reality is relational, then learning cannot happen in isolation from the world. It must happen in and through engagement with people, places, materials, and other-than-human beings.

This relational turn has gained significant traction across several fields, including posthumanist education, more-than-human design, and ecological philosophy. Scholars such as Donna Haraway (1988, 2016), David Abram (1996) and Karen Barad (2006), have each, from different disciplinary angles, challenged the primacy of the detached human subject as the starting point of knowledge. What they share is an insistence that knowing is always situated, embodied, and entangled with the wider world. The three pedagogies explored in this section all operate from this same ontological ground, though they arrive there through different routes and emphasise different dimensions of the relational.

2.3.2 Embodied Learning

Healing Disconnection from the Body: One of the most persistent features of Western educational culture is its abstraction from the body. Learning is understood primarily as a cognitive activity: reading, analysing, reasoning, producing written or verbal outputs. The body, when it enters the picture at all, is treated as a vehicle for the mind, something that carries the student from one classroom to another, but does not itself participate in knowing. This has consequences well beyond the classroom. As phenomenological philosophers have argued, the ongoing suppression of bodily awareness in educational contexts mirrors and reinforces a broader cultural disconnection from sensory, felt experience and by extension, from the sensory world in which ecological relationships are embedded (Abram, 1996; Merleau-Ponty, 1962).

Embodied learning challenges this arrangement directly. Rooted in phenomenological traditions, particularly the work of Maurice Merleau-Ponty, it proceeds from the premise that the body is not an instrument of the mind but its very ground. We do not first perceive the world cognitively and then experience it bodily; perception itself is always already bodily. As Merleau-Ponty (1962) argued, we know the world through our "lived body", through movement, touch, smell, balance, and the pre-reflective responsiveness of the organism to its environment. This is the foundation upon which all conceptual understanding is built.

Learning Through Senses, Materials, Doing: In educational practice, embodied learning takes many forms. At its core, it involves learning through doing, making, moving, and sensing rather than exclusively through reading and writing. Craft-based learning, movement-based pedagogies, working with physical materials, drawing, and building all of these invite the body into the knowing process (Pallasmaa, 2017). Importantly, embodied learning is not reducible to "hands-on activities" in the shallow sense of that phrase. The distinction lies in whether the physical engagement is treated as a means to an end (making something to demonstrate a concept) or as epistemologically central, as a mode of inquiry that produces knowledge that cannot be produced any other way.

A particularly relevant body of work here comes from Häggström (2019), whose study of outdoor science education in a Swedish forest setting documented how learning changed when they moved from the classroom to a forested environment. The researcher observed that students developed a lived body relationship to the forest, a form of knowing inseparable from movement, sensation, and direct contact with living things. This was qualitatively different from reading about forest ecology as it produced ecological understanding at the level of felt experience, not just conceptual description.

From an eco-centric perspective, embodied learning matters for a specific reason: ecological relationships are, at their most fundamental, sensory relationships. The connection between a tree and its soil, between a river and its catchment, between a body and a place, none of these can be fully grasped through abstraction alone. They must, at some level, be felt. As Abram (1996) argued, the ecological crisis is in part a crisis of perception, a consequence of cultures that have learned to inhabit only the interior world of language and concept, and have lost the capacity for the reciprocal sensory engagement with the living world that sustained more place-rooted ways of life. Embodied pedagogies, at their best, are not simply different teaching methods; they are attempts to cultivate a different quality of attention, one that remains open to the more-than-human world as a source of meaning and intelligence.

2.3.3. Place-Based Learning

Healing Disconnection from Nature and World: Place-based education emerged in the late twentieth century as a response to what its proponents identified as the placelessness of mainstream schooling, the tendency to treat curriculum as something that can be delivered anywhere, to anyone, regardless of where they actually live (Gruenewald, 2003; Sobel, 2004). The foundational claims that learning is always most meaningful when it is rooted in the actual places students inhabit. This includes the local environment, the particular land, water, plants, animals, and climate of a specific location, as well as local culture, history, and community. As Gregory Smith (2002) explains, place-based education focuses on grounding learning in local contexts and students' lived experiences.

At its most developed, however, place-based learning goes further than "using the local as context." It involves a reorientation of the relationship between learner and world, from the learner as subject who observes and studies a place from the outside, to the learner as participant who is embedded in, accountable to, and co-constituted by place (Lynch & Mannion, 2021). This is the distinction between place as resource and place as teacher. In the latter framing, the land does not simply provide material for curriculum but it actively shapes what is noticed, what is felt, and what questions become possible to ask.

Land and Territory as Teacher

Several strands of place-based education have developed this relational understanding of place more fully. Particularly in contexts shaped by land-based knowledge traditions, the concept of land as teacher carries a depth that exceeds the Western place-based education literature's more instrumental framing. Where Smith and Sobel tend to emphasise the pedagogical benefits of local contextualization for academic learning, scholars drawing on land-based and ecological perspectives argue that the land itself is an active agent in the learning process, not simply a setting, but a relational partner (Cajete, 1994 ; Simpson, 2014).

This has practical implications for pedagogy. A forest, a river, or a snowfield is not interchangeable with a classroom because it offers content that a classroom cannot. It demands a different kind of attention, slower, more patient, more responsive to what is actually present. It requires learners to adapt to conditions they do not control, to notice what is living, and to make decisions in context (Gruenewald, 2003). These are orientations, ways of being with the world that cannot be taught through instruction but must be cultivated through direct, ongoing encounter. Gruenewald's (2003) "critical pedagogy of place" adds a further layer, insisting that place-based education must not only reconnect students to local environments but also make visible the social, political, and colonial histories through which particular relationships to land have been constructed and disrupted.

The relationship between place-based learning and eco-centric thinking is particularly close. If an eco-centric orientation requires recognising the non-human world as having agency, value, and significance beyond its utility for humans, then place-based learning provides one of the most concrete available pathways toward that recognition. It is difficult to continue treating a forest as a "resource" after you have spent time learning to read its particularities, noticing which birds arrive in which season, where the soil changes texture, and how the light moves through the canopy at different times of day. Place-based learning cultivates what Robin Wall Kimmerer (2014) calls a "grammar of animacy" (Kimmerer, 2014, p21), a way of relating to the living world that sees it as populated with subjects rather than objects.

2.3.4. Relational and Ecological Learning

Healing Objectification Through Understanding Interconnection: The third pedagogical approach addressed here builds most explicitly on the ecological and systemic dimension of what it means to learn in a more-than-human world. Where embodied learning emphasises the knowing body, and place-based learning emphasises rootedness in particular territory, relational and ecological learning foregrounds the web of interdependencies, biological, social, temporal, and more-than-human, within which all life, including human learning, takes place (Su & Wood, 2023).

This tradition draws from multiple sources. Systems thinking, as developed in the work of Gregory Bateson (1972) and later elaborated by ecological educators such as David Orr (1992) and Fritjof Capra (1996), offers a framework for understanding living systems as characterised by patterns of relationship, feedback, and circular causality rather than linear chains of cause and effect. Bateson's (1972) foundational claim that "the unit of survival is the organism plus its environment" challenges the individualism implicit in much Western educational thought. Learning, from this perspective, is not the acquisition of knowledge by an individual mind, but the ongoing reorientation of an organism within a web of relationships.

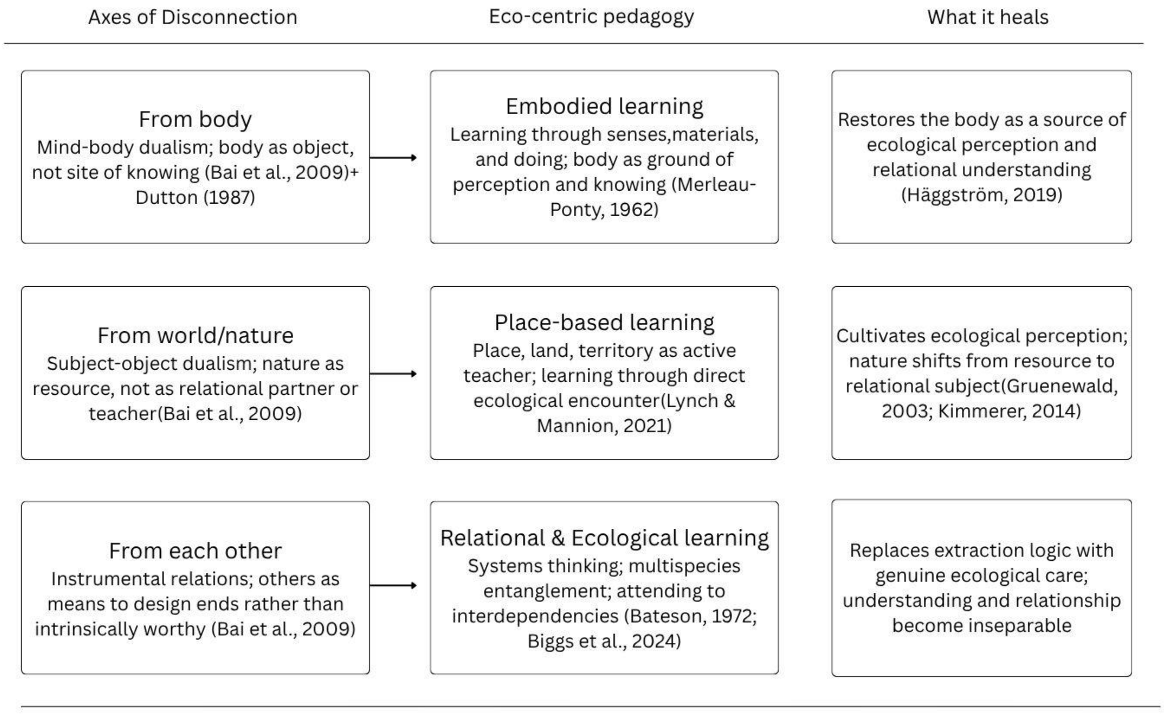
Systems Thinking, Patterns, Cycles, and Multispecies Entanglement: In educational practice, relational and ecological learning takes several overlapping forms. At its core, it shifts learners from seeing living systems as collections of separate objects toward understanding them as webs of ongoing relationships and interdependence. Rather than studying forests, watersheds, or food systems as things with fixed properties, this kind of learning asks how these systems function, how energy moves, how organisms respond to each other, how disturbance in one part ripples through the whole (Lynch and Mannion, 2021). This orientation directly resists the reductionism built into much conventional curriculum design, where topics are taught in isolation from the living contexts they actually belong to (Sterling, 2001). What it cultivates instead is a tolerance for complexity, non-linearity, and emergence, the messy, dynamic qualities that characterise how actual ecosystems behave. Lynch and Mannion (2021) describe something similar when they talk about learning to notice and respond to "socio-environmental processes" in a place, recognising that what happens between organisms, and between organisms and their environments, is itself the subject of learning, not just background noise.

Pattern-based and cyclical learning draws attention to the rhythms and recurring structures that characterise ecological time, seasons, migration cycles, decomposition and regeneration, and the long arcs of succession in plant communities (Carpena-Méndez et al., 2022). This is a different relationship to time than the linear, progress-oriented temporality that pervades most educational systems (Lees & Bang, 2023). Learning to notice and attune to cyclical patterns is itself a form of ecological reorientation; it places the learner within biological time rather than the clock time of institutions and markets.

Perhaps most significant for the purposes of this thesis is the more recent development of multispecies and more-than-human approaches to relational learning. Building on the work of Donna Haraway (2016), Quay, J. (2021), and others working at the intersection of science studies and ecological thinking, these approaches ask what it would mean to include non-human beings as genuine participants in learning encounters, not as objects of study, but as interlocutors whose behaviours, signals, and responses carry meaning.

Researchers such as those at Tel Aviv University have developed methods for listening to plant acoustic stress signals, pointing toward a future in which the boundary between ecological science and interspecific communication becomes increasingly porous (Khait et al., 2023). Multispecies ethnography, as a pedagogical method, trains students to attend to the agencies and perspectives of non-human organisms to question what this species is responding to, and what might that tell us about the state of the system it inhabits? (Ogden et al., 2013).

The relational and ecological learning approach is distinctive in how directly it addresses what might be called the objectification problem in conventional education. When learners are trained to observe living systems from a position of detachment to study them without any felt sense of connection or reciprocity, they are simultaneously being trained in the perceptual habits that make ecological exploitation possible. Relational and ecological learning reverses this orientation by insisting that understanding and relationship are inseparable, that to truly understand an ecosystem, one must also enter into a relationship with it. This is an epistemological claim, backed by a growing body of research suggesting that care, attention, and sustained presence are prerequisites for the kind of deep ecological understanding that abstract analysis alone cannot provide (Kimmerer, 2014; Roös, 2021).



Axes of Disconnection	Eco-centric pedagogy	What it heals
From body Mind-body dualism; body as object, not site of knowing (Bai et al., 2009)+ Dutton (1987)	**Embodied learning** Learning through senses,materials, and doing; body as ground of perception and knowing (Merleau-Ponty, 1962)	Restores the body as a source of ecological perception and relational understanding (Häggström, 2019)
From world/nature Subject-object dualism; nature as resource, not as relational partner or teacher(Bai et al., 2009)	**Place-based learning** Place, land, territory as active teacher; learning through direct ecological encounter(Lynch & Mannion, 2021)	Cultivates ecological perception; nature shifts from resource to relational subject(Gruenewald, 2003; Kimmerer, 2014)
From each other Instrumental relations; others as means to design ends rather than intrinsically worthy (Bai et al., 2009)	**Relational & Ecological learning** Systems thinking; multispecies entanglement; attending to interdependencies (Bateson, 1972; Biggs et al., 2024)	Replaces extraction logic with genuine ecological care; understanding and relationship become inseparable

Each pedagogy addresses one axis; together they form the eco-centric foundation for Section 2.4

Figure 2: *Eco-centric pedagogical responses to the three axes of disconnection.*

Each pedagogy addresses one axis: embodied learning heals disconnection from body (Merleau-Ponty, 1962; Häggström, 2019), place-based learning heals disconnection from world and nature (Lynch & Mannion, 2021; Kimmerer, 2014), and relational and ecological learning heals disconnection from others and living systems (Bateson, 1972; Biggs et al., 2024). Together, they form the pedagogical foundation explored in Section 2.3.

2.4 Towards Eco-Centric Service Design Education

The three preceding sections have traced two largely separate trajectories. On one side sits service design education, a field that has grown considerably in scope and ambition; however continues to operate from a foundational anthropocentrism, which not only shapes what is taught but how learning is structured, where it happens, and whose experience counts as worth designing for (Mukhopadhyay & Ray, 2025). On the other side sit eco-centric pedagogies: (1) embodied learning, (2) place-based learning, (3) relational and ecological learning that have developed robust theoretical and practical approaches for cultivating a different relationship with the living world, but largely outside of design education contexts. This final section of the literature review focuses on what happens when these two trajectories are brought into direct conversation, what already exists at their intersection, what remains missing, and what that gap means for the questions this thesis sets out to answer.

2.4.1 Emerging Moves Toward More-Than-Human Design Education

The field of design education is not entirely without attempts to move beyond human-centeredness. Several significant developments in recent years signal a growing recognition that the ecological crisis demands more than sustainability add-ons to existing frameworks. The most developed among these is the MOVA (More-than-Human Values) framework developed by Nilsson et al. (2025), based on a collaboration between Malmö University, Aarhus University, and Eindhoven University of Technology, and co-funded by the Erasmus+ Programme of the European Union.

It proposes concrete pedagogical activities for integrating more-than-human perspectives into design education, including expanded stakeholder mapping, more-than-human ethnography, and modified design process structures (Nilsson et al., 2025). MOVA represents a genuine attempt to operationalise the theoretical commitments of posthumanism and new materialism within a design pedagogy context, and its existence signals that the field is beginning to take this seriously.

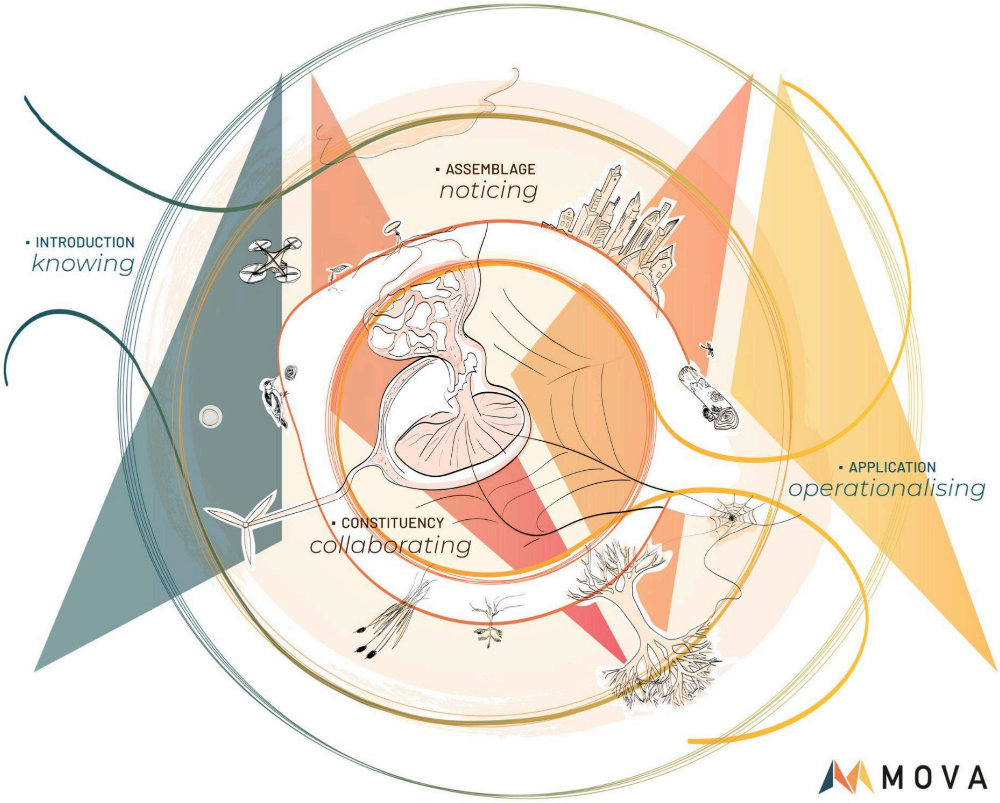
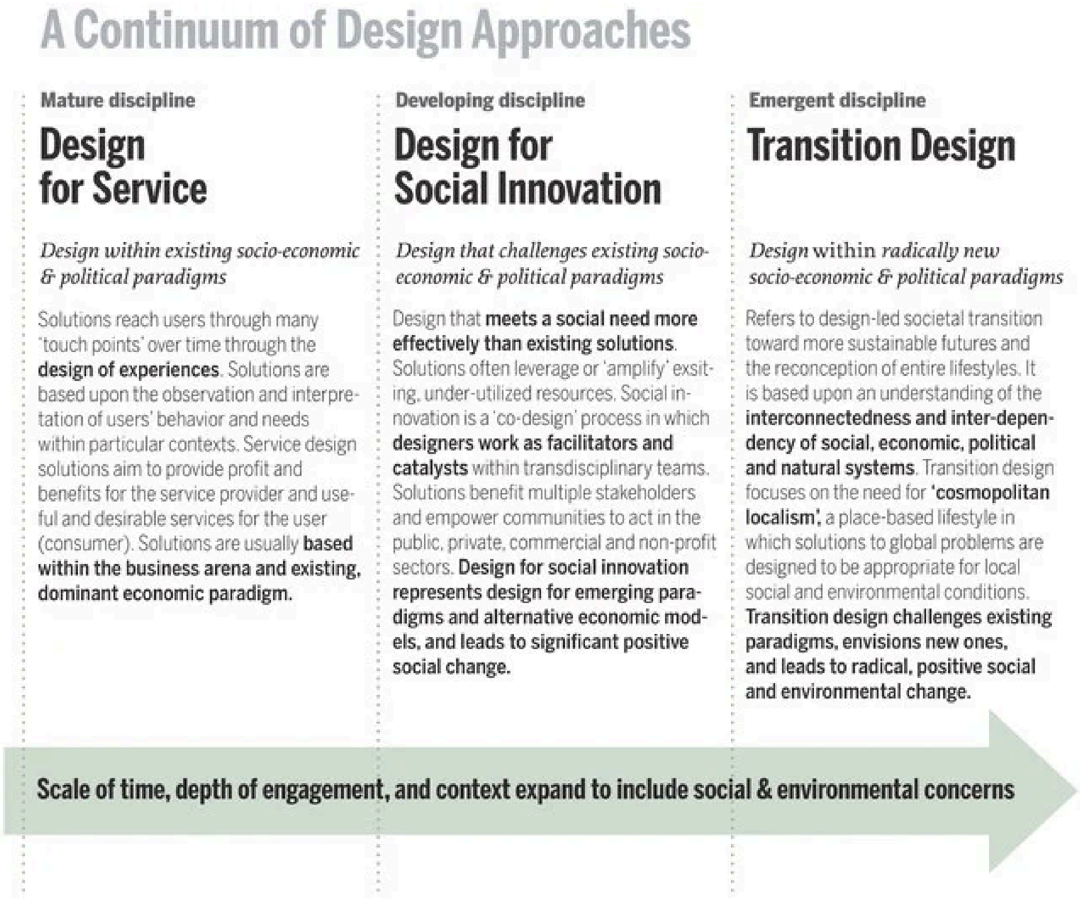


Figure 3: *Visual presentation of the theoretical MOVA framework and the four dimensions.*

Note. From "MOVA Evaluation Report : Development and Pilot Testing of Educational Resources for Teaching More-than-Human Perspectives in Technology Design" by Nilsson, E. M., Hansen, A.-M., Eriksson, E., Hagensby Jensen, R., Barendregt, W., & Yoo, D. (2025). Retrieved from Malmö universitet website: https://urn.kb.se/resolve?urn=urn:nbn:se:mau:diva-80261

At a broader scale, the Transition Design framework developed at Carnegie Mellon University (Irwin et al., 2020) positions design education within a much larger socio-ecological context, incorporating living systems theory, systems ecology, and long-term temporal thinking into design pedagogy. Transition Design (Irwin, 2015) is arguably the most thorough attempt to reorient design education toward ecological timescales and planetary boundaries, and it has directly influenced thinking about how service design might engage with sustainability at a systemic rather than superficial level.



A Continuum of Design Approaches

Mature discipline

Design for Service

Design within existing socio-economic & political paradigms

Solutions reach users through many 'touch points' over time through the **design of experiences**. Solutions are based upon the observation and interpretation of users' behavior and needs within particular contexts. Service design solutions aim to provide profit and benefits for the service provider and useful and desirable services for the user (consumer). Solutions are usually **based within the business arena and existing, dominant economic paradigm.**

Developing discipline

Design for Social Innovation

Design that challenges existing socio-economic & political paradigms

Design that **meets a social need more effectively than existing solutions**. Solutions often leverage or 'amplify' existing, under-utilized resources. Social innovation is a 'co-design' process in which **designers work as facilitators and catalysts** within transdisciplinary teams. Solutions benefit multiple stakeholders and empower communities to act in the public, private, commercial and non-profit sectors. **Design for social innovation represents design for emerging paradigms and alternative economic models, and leads to significant positive social change.**

Emergent discipline

Transition Design

Design within *radically new socio-economic & political paradigms*

Refers to design-led societal transition toward more sustainable futures and the reconception of entire lifestyles. It is based upon an understanding of the **interconnectedness and inter-dependency of social, economic, political and natural systems**. Transition design focuses on the need for **'cosmopolitan localism'**, a place-based lifestyle in which solutions to global problems are designed to be appropriate for local social and environmental conditions. **Transition design challenges existing paradigms, envisions new ones, and leads to radical, positive social and environmental change.**

Scale of time, depth of engagement, and context expand to include social & environmental concerns

Figure 4: *A Continuum of Design Approaches by Terry Irwin (2015)*

Note. From "Transition Design: A Proposal for a New Area of Design Practice, Study, and Research. Design and Culture" by Irwin, Terry. (2015). 7. 229-246. 10.1080/17547075.2015.1051829.

In research practice, multispecies ethnography (Biggs et al., 2024) has begun to offer concrete methods for how designers and design students might develop genuine attentiveness to non-human beings, not as objects to design for but as agents whose behaviours, responses, and needs carry meaning for the design process. The noticing practices, embodiment probes, and biological empathy mapping described by Biggs et al. (2024) demonstrate that the theoretical commitment to more-than-human perspectives can be translated into actual learning activities that shift how students perceive and engage with the living world.

These developments are significant, and they should be acknowledged honestly. This thesis does not argue that nothing is happening; it argues that what is happening has not yet reached service design education in particular, and that the pedagogical approaches most capable of producing a genuine paradigm shift, rather than conceptual addition, have not been drawn into that conversation.

2.4.2 The Gap This Research Addresses

What these existing contributions share, despite their genuine differences in scope and ambition, is a common structural limitation: they introduce more-than-human and ecological perspectives primarily as conceptual and methodological additions to design processes already underway, rather than addressing the foundational conditions of learning through which a genuine ecological orientation might be cultivated in students.

Transition Design (Irwin et al., 2020) explicitly identifies worldview and paradigm shift as the single most powerful leverage point for sustainable transition, drawing on Meadows' (2008) observation, it highlights how deeply embedded paradigms are often the hardest elements of a system to change. Building on this, Irwin et al. (2020) argue that designers must develop what they call a new "posture and mindset" (Irwin et al., 2020, p.20), one that moves from a mechanistic, reductionist worldview to a holistic, ecological one. However, the Transition Design framework itself, when it reaches the question of how to educate for this shift, largely relies on readings, lectures, studio-based exercises, and case study critique.

The very thing the framework identifies as most critical, a transformation in how designers understand their relationship to the living world, is assumed to follow from exposure to ideas about that transformation. Irwin et al. (2020) claim local wisdom as a source of insight, noting that pre-industrial societies "lived sustainably in place for generations, informed by slow knowledge that was place-based and embedded within local cultures" (Irwin et al., 2020, p.48), but this remains undeveloped as a pedagogical principle. The framework gestures toward where change needs to happen without providing the pedagogical conditions through which it might actually occur.

The MOVA framework (Nilsson et al., 2025), a pedagogically developed initiative in this space, encountered the same structural tension in direct practice. Its evaluation documented that students piloting more-than-human teaching activities described feeling overwhelmed by unfamiliarity with ecological systems, uncertain how to connect theoretical commitments to design practice, and, in one revealing comment, questioned whether such engagement belonged in a design course at all (Bekker et al., 2023; Nilsson et al., 2025).

MOVA's own educators identified persistent challenges around representation, how to give meaningful voice to non-human actors in a design process and, significantly, around bias, "particularly when students attempt to bring in perspectives from other cultures that are more aligned with more-than-human ecological worldviews" (Bekker et al., 2023, p. 57). These difficulties signal that when more-than-human perspectives are introduced into design education primarily as a conceptual reorientation layered onto existing anthropocentric ways of knowing, students lack the perceptual, relational, and ecological foundations needed to actually work with them.

This is precisely the gap that eco-centric pedagogical approaches reviewed in Section 2.3 are positioned to address, not as alternatives to MOVA or Transition Design, but as the foundational learning conditions that make such frameworks operable. Embodied learning, place-based learning, and relational and ecological learning cultivate the perceptual and relational capacities through which such entanglement becomes genuinely available as a basis for design thinking.

Place-responsive attunement is a developed skill requiring structured, sustained, and embodied engagement with specific environments (Lynch and Mannion, 2021). The qualitative shift in ecological understanding educators seek cannot be produced through conceptual instruction alone; it requires direct, sensory encounter with living systems (Häggström, 2019). What is missing, in other words, is not further argument for why ecological perspectives matter in design education, but a synthesis of pedagogical principles that addresses how to build the relational and ecological capacities in students that make meaningful engagement with those perspectives possible, developed specifically for the context of service design education.

Service design education, with its emphasis on empathy, relational dynamics, and systems thinking, is arguably better positioned than many design disciplines to take this kind of pedagogical shift seriously. Its foundational methods, like user research, co-design, service prototyping, and the mapping of experiences across time and context, all involve practices of attention, noticing, and relational engagement that could, in principle, be extended toward the more-than-human world. Shifting that frame does not necessarily require abandoning the methods; it requires reorienting the perspective from which they are used (Wakkary, 2021).

2.4.3 Positioning the Research Need

The preceding sections establish three converging lines of evidence. Service design education carries structural anthropocentrism embedded not just in its content but in its assessment frameworks, partnership models, and studio conditions; these patterns persist even where sustainability is nominally present (Čaić et al., 2025; Jung & Mejía, 2023; Nilsson et al., 2024).

Eco-centric pedagogies: embodied learning (Häggström, 2019; Merleau-Ponty, 1962; Pallasmaa, 2017), place-based learning (Gruenewald, 2003; Kimmerer, 2014; Lynch & Mannion, 2021), and relational and ecological learning (Bateson, 1972; Biggs et al., 2024; Sterling, 2001), offer grounded, pedagogically tested approaches for cultivating the perceptual and relational capacities that eco-centric orientation requires.

And the recent design-education initiatives that move in this direction: Transition Design (Irwin et al., 2020) and MOVA (Bekker et al., 2023; Nilsson et al., 2025) identify paradigm and worldview shift as the core need (Meadows, 2008, as cited in Irwin et al., 2020) while stopping short of the pedagogical conditions through which that shift might actually be produced, particularly in the specific context of service design. The gap is therefore not theoretical but operational in how to translate what embodied, place-based, and relational ecological learning is into guiding principles legible and usable within service design education.

The aim is to address usability principles concrete enough that a service design educator can engage with them without abandoning the methods and contexts they already work within, while genuinely shifting the orientation from which those methods are applied (Wakkary, 2021). The following chapter describes the research approach through which this synthesis was developed.

3. RESEARCH DESIGN

This chapter describes the research approach, data collection methods, participant selection, and analytical process through which this thesis was developed. It explains how the study was designed to address the three research questions, and outlines the ethical considerations and limitations that shaped how the research was conducted.

Design research can be understood through three broad orientations, first articulated by Frayling (1993) and subsequently developed within design scholarship. Research *into* design examines design history, theory, and practice as objects of study, seeking to understand how design works, what it is, and how it has evolved. Research *through* design generates knowledge in the process of designing itself, where the act of making, prototyping, or intervening produces insights that could not be arrived at any other way. Research *for* design produces knowledge that serves and informs design practice frameworks, principles, or conceptual tools that practitioners and educators can draw on in their work.

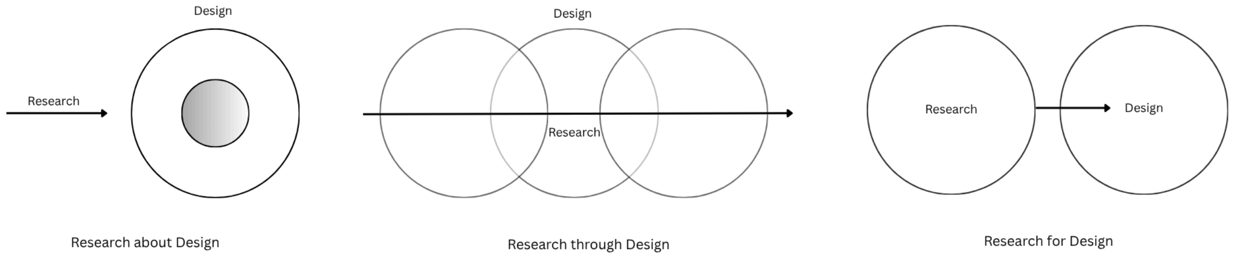


Figure 5: *Three approaches to Design Research (Source: Adapted from Manolakelli, 2023)*

This thesis operates within the *research for design* tradition. It does not produce a designed artefact, test an intervention, or evaluate a course. Instead, it develops a framework of guiding principles, grounded in literature synthesis and practitioner interviews that service design educators can use to integrate eco-centric perspectives into their teaching.

3.1 Research Philosophy

This research adopts a qualitative, exploratory approach situated within an interpretivist philosophical stance. Interpretivism holds that knowledge is not discovered as objective fact but constructed through meaning-making, that understanding human experience requires engaging with the perspectives, practices, and contexts of the people involved (Creswell & Poth, 2017 ; Goulding, 1999). This position is appropriate for the present study because the research questions concern not measurable outcomes but lived educational practice: how educators understand their work, what they find challenging, and what they have found useful. Such questions resist quantification; they require sustained, open-ended engagement with practitioner knowledge.

The research also carries a critical orientation, in the tradition of inquiry that questions dominant assumptions and asks whose knowledge counts (Kincheloe & McLaren, 2011). Service design education's anthropocentric foundation, the argument developed in Chapter 2 is not a neutral state of affairs but the product of historical decisions about what design is for and whose experience matters. Examining that foundation and asking how it might shift requires a research stance that does not take existing conditions for granted.

3.1.1 Qualitative Approach

A qualitative approach was chosen over survey or experimental methods for reasons specific to the research goal. The aim is not to measure the prevalence of ecological thinking in SD curricula, or to test whether a particular intervention improves student outcomes. It is to develop a synthesised framework of guiding principles grounded in practitioner knowledge, a goal that requires access to the texture of educators' experience: what they have tried, what has worked, what they feel is missing, and what they would need to do things differently. Semi-structured interviews are among the most appropriate instruments for this kind of access, allowing the researcher to follow threads of reasoning, ask for concrete examples, and remain responsive to what participants themselves identify as significant (Kvale & Brinkmann, 2015 ; Pulla & Carter, 2018).

3.2 Data Collection: Semi-Structured Interviews

3.2.1 Interview Design and Structure

Semi-structured interviews were chosen as the primary data collection method. Unlike structured interviews, which follow a fixed script, or unstructured conversations, which lack consistent points of comparison across participants, semi-structured interviews combine a pre-designed set of core questions with the flexibility to pursue emerging threads and ask for elaboration (Kvale & Brinkmann, 2015). This format was particularly suited to the present research because participants came from two very different professional contexts: service design education and eco-centric pedagogy and the interview guides needed to be tailored accordingly while still generating comparable data across each group.

Two separate interview guides were developed, one for each participant group. The guide for service design educators focused on their current pedagogical practice, how ecological and environmental considerations are presently addressed in their teaching, what structural constraints they experience, and what they identified as missing or underdeveloped. The guide for educators who work with eco-centric approaches in higher education contexts focused on the principles and practices that guide their teaching, how they navigate ecological knowledge in institutional contexts, and what advice they would offer to educators seeking to integrate these approaches in unfamiliar disciplinary settings. Both guides are provided in full in Appendix A and Appendix B, respectively.

Interviews were conducted online via video call and ranged in duration from approximately 35 to 55 minutes. All participants provided informed consent prior to the interviews. They were informed about the purpose of the study, their rights, the voluntary nature of their participation, and data protection protocols. Interviews were conducted in English, held online to allow flexibility and participation across regions, and were audio-recorded with explicit permission. All recordings were transcribed for analysis, and responses were anonymised to ensure confidentiality. This approach aligns with ethical guidelines for social research and complies with the Finnish Data Protection Act (1050/2018).

3.2.2 Participant Selection and Recruitment

Participants were selected using purposive sampling, a strategy in which participants are chosen not for statistical representativeness but because they hold specific knowledge or experience directly relevant to the research questions (Etikan, 2016; Patton & Patton, 2002). Two distinct groups were sought.

The first group comprised service design educators, academics actively teaching service design at higher education institutions. Inclusion criteria required that participants hold a teaching role in a service design or closely related design program, and that they had some prior engagement with sustainability, ecological thinking, or more-than-human perspectives in their practice, even if partial or exploratory. This criterion was important because the research sought to understand both what educators were already attempting and what barriers they encountered, which required participants who had at least begun to grapple with the question.

The second group comprised educators working with eco-centric, nature-based, or place-based pedagogical approaches, practitioners whose teaching practice engages directly with living systems, relational learning, or embodied ecological engagement. These participants were not required to have any background in service design; their value to the research lay precisely in their experience of pedagogical traditions that SD education has not yet engaged with.

Recruitment was conducted through professional networks, and direct outreach to academics identified through LinkedIn. Potential participants were contacted via email with a brief description of the study's purpose and an invitation to participate. All seven participants who agreed to be interviewed are included in the analysis; no participants withdrew after agreeing.

3.3 Participants

Seven participants were interviewed across the two groups: four service design educators and three eco-centric educators. Table 1 provides an anonymised overview of each participant. Participants are referred to throughout this thesis by the codes assigned in the table (SD1–SD4 and EC1–EC3) rather than by name or institutional affiliation.

Table 1. Overview of interview participants and their relevance to the research

Participant type	n	Who they are	Why they are relevant
Service design educators (codes: SD1-SD4)	4	Academics actively teaching service design at higher education institutions across European contexts, with some prior engagement with sustainability or ecological thinking in their practice	Provide first-hand accounts of how ecological perspectives are currently, or are not, integrated into SD education, what structural and pedagogical barriers they encounter, and what they identify as missing. Their insights directly address RQ2.
Educators working with eco-centric pedagogical approaches (codes:EC1–EC3)	3	Educators and practitioners working with nature-based, place-based, or relational pedagogical approaches in higher education and non-formal learning contexts, coming from Brazil, Canada, Kenya	They offer grounded accounts of how eco-centric learning is enacted in practice, what principles guide it, how it differs from conventional teaching, and what it produces in learners. Their insights directly address RQ1.

The composition of the participant group was deliberate. The four service design educators collectively provide insight into how ecological thinking is currently or is not integrated into SD education across different institutional and national contexts, and what educators themselves identify as the structural and conceptual barriers to deeper integration. The three eco-centric educators provide a counterpoint: accounts of how ecological, relational, and place-based pedagogies are enacted in practice, and what that experience has taught them about the conditions under which genuine ecological orientation in students can be cultivated. Bringing these two groups into dialogue, through the analysis described in Section 3.4 is what enables the synthesis that addresses RQ3.

3.4 Data Analysis

3.4.1 Reflexive Thematic Analysis

Data were analysed using reflexive thematic analysis, as developed by Braun and Clarke (2006, 2019). Reflexive thematic analysis is a method for identifying, analysing, and interpreting patterns of meaning, themes across qualitative data. It is distinguished from other approaches to thematic analysis by its explicit acknowledgement that themes do not simply exist in data waiting to be found, but are actively constructed by the researcher through a process of interpretation that is necessarily shaped by the researcher's own perspective and theoretical commitments (Braun & Clarke, 2019). This transparency is a strength rather than a limitation as it makes the analytical process accountable and open to scrutiny.

The analysis followed the six phases described by Braun and Clarke (2006): familiarisation with the data; generating initial codes; searching for themes; reviewing themes; defining and naming themes; and producing the final analysis. Each interview transcript was read multiple times before coding began, with notes taken on initial observations and emerging patterns. Coding was conducted inductively, following what the data itself offered, but was also informed deductively by the theoretical framework developed in the literature review, particularly the Bai et al. (2009) axes of disconnection and the three eco-centric pedagogical traditions examined in Section 2.3.

3.4.2 Coding Process and Theme Development

Initial coding generated a large number of fine-grained codes across both participant groups. For the service design educator group, codes clustered around structural constraints, current sustainability practice, what participants identified as absent or underdeveloped, and what they said they would need to do things differently. For the eco-centric educator group, codes clustered around pedagogical principles, the role of place and the body in learning, relational practices, and the challenges of working within institutional structures that do not share their orientation.

Following initial coding, codes were grouped into candidate themes and reviewed against the full dataset to check whether they accurately represented the range of what participants had expressed. Themes were then refined, defined, and named. The final themes for each group are presented in Chapter 4, where they form the basis of the findings sections addressing RQ1 (eco-centric educator interviews) and RQ2 (service design educator interviews).

3.4.3 Synthesis: From RQ1 and RQ2 to RQ3

The third research question: what guiding principles can support the integration of eco-centric perspectives in service design education, was addressed through a deliberate synthesis process rather than through additional data collection. Once the themes from both participant groups had been established, they were brought into direct conversation with each other and with the literature review, using a synthesis matrix.

The matrix maps identified gaps in SD education (from RQ2) against eco-centric pedagogical approaches that address those gaps (from RQ1 and the literature). Each intersection in the matrix represents a candidate principle, a point where what is missing in SD education corresponds to what eco-centric pedagogical traditions offer. This approach follows an abductive logic (Peirce, 1997; Timmermans & Tavory, 2012), moving iteratively between theoretical frameworks and empirical data rather than moving in only one direction. The synthesis matrix is presented in Chapter 4 (Table 4), and the principles derived from it are developed in full in Chapter 5.

3.5 Ethical Considerations

This research followed established ethical protocols for qualitative research involving human participants. All seven interview participants provided informed consent after receiving detailed information about the study's purpose, their voluntary participation, and their right to withdraw at any time. Interviews were conducted with explicit permission to record, and participants were assured of confidentiality. To protect participant identities while preserving the analytical value of their insights, all educators are anonymised in this thesis. Quotes are attributed by participant code (e.g., SD1, EC2) rather than by name or institution. Interview recordings and transcripts are stored securely and accessible only to the researcher, with data retained only for the duration necessary to complete the research.

This research also required careful attention to how eco-centric knowledge systems are engaged. As a researcher with a background in plant science and service design but without lived experience in many of the pedagogical approaches examined, the approach taken was one of learning rather than authority. The principles developed in this thesis does not claim to represent or speak for eco-centric knowledge approaches; it synthesises insights from educators who work within and alongside these traditions, and draws on published scholarship authored by practitioners and scholars from within those approaches. The research seeks to learn from eco-centric pedagogies while avoiding appropriation, recognising that authentic integration of these perspectives into service design education requires ongoing dialogue, respect for knowledge holders, and acknowledgement of the limitations inherent in any external examination of pedagogical practices rooted in specific cultural and ecological contexts.

Several limitations shape what this research can claim. The sample of seven participants, while appropriate for an exploratory qualitative study, is small and does not represent the full breadth of either service design education or eco-centric pedagogy globally. The service design educators interviewed were primarily located in European contexts, which means the findings may not fully reflect the diversity of SD education internationally. The eco-centric educators came from a range of disciplinary backgrounds, none of which were service design specifically, which means the translation of their insights into SD contexts involves a degree of interpretive inference that a larger or more targeted sample might reduce. Finally, the research focuses on educational practice rather than student outcomes, it captures what educators believe and intend, not what students actually experience or learn as a result. These limitations are acknowledged here and returned to in the discussion in Chapter 6.

4. RESULTS AND SYNTHESIS

This chapter presents the empirical findings of the research, organised in direct correspondence with the three research questions.

Section 4.1 addresses RQ1 through analysis of interviews with practitioners of eco-centric pedagogical approaches, examining what principles and practices guide their teaching and what those approaches offer to design education.

Section 4.2 addresses RQ2 through analysis of interviews with service design educators, examining how ecological perspectives currently appear, or fail to appear in SD education and what structural and pedagogical factors sustain that absence.

Section 4.3 brings both sets of findings into dialogue through a synthesis matrix, identifying the convergences between eco-centric pedagogical approaches and service design's pedagogical gaps that give rise to the guiding principles developed in Chapter 5.

4.1 Interviews with practitioners of eco-centric pedagogical approaches (RQ1)

4.1.1 Introduction

The three participants in this group represent distinct professional and cultural contexts: (1) a Brazilian researcher, artist, and educator whose practice centres on natural dyes and place-based material inquiry; (2) an Indian-Canadian educator working at the intersection of formal schooling and land-based experiential learning; and (3) a South African academic specialising in curriculum transformation and the integration of ecological knowledge systems into higher education.

Despite these differences, the interviews generated a strikingly coherent set of themes. What united their accounts was not a shared method or institutional context but a shared epistemological orientation, the conviction that meaningful learning about the ecological world must happen through direct, embodied, and relational engagement with it, rather than through its representation in classroom settings. Themes were generated through reflexive thematic analysis, moving between the data and the theoretical framework established in Chapter 2, with particular attention to both convergence across participants and nuances specific to individual accounts.

4.1.2 Observations

All three participants locate the beginning of learning not in content but in context. Before any lesson plan, framework, or educational objective, each describes attending first to place, to what is present in a specific territory, what season it is, what materials are available, what relationships between humans and non-human elements are already there.

For EC1, this orientation is made explicit: "The first thing I attend to is the territory, what plants are available, the season, the climate." This is not instrumental preparation but epistemological positioning, an acknowledgement that the learning environment is not neutral space to be filled with curriculum but an active participant in what becomes possible to know. EC2 describes a related principle through a concrete project: "I'm setting up that land as a textbook," designing a learning environment in which a specific piece of land, with its trees, water flows, and agricultural history, becomes the primary pedagogical resource rather than a supplement to one.

What follows from this spatial and relational grounding is an insistence on materiality and time as constitutive of understanding rather than incidental to it. All three participants describe learning as something that unfolds slowly, through repeated physical engagement, in ways that cannot be accelerated without being fundamentally altered. EC1 articulates this most directly as “Color doesn't reveal itself immediately, it requires time, and I see that as part of the pedagogy."

EC3 offers a parallel formulation from her own practice: "In the next three years, the child becomes an expert because they do this every day." These are not only arguments for experiential learning in the conventional sense of hands-on activity but are also claims about what kind of knowledge is produced through sustained, embodied, repetitive engagement with living materials and systems, and what is lost when that process is compressed into the timeframes and spatial conditions of conventional higher education.

The friction between these temporal and relational requirements and the institutional structures of higher education was acknowledged by all three participants as a persistent and unresolved tension in their work.

4.1.3 Thematic Analysis

Six themes emerged from the thematic analysis process, ranging from the role of place and materiality in learning to questions of positionality and the limits of translation. Each theme is presented below with representative quotes and a note on its significance for service design education.

Table 2. Thematic Analysis of Interviews with practitioners of eco-centric pedagogical approaches

Theme	Sub-theme	Supporting quote	Significance for SD education
1. Place and territory as active teacher	*Place as curriculum, not just context*	“Land is not something we use to teach, it's something we learn with.” (EC1)	SD studios abstract away from living environments; this theme challenges the separation of design thinking from ecological embeddedness
	Specificity of place over universality	“Each learning experience is different depending on where we are.” (EC3)	SD methods are typically portable and context-independent; place-based learning requires context-specific engagement
	Long-term relationships with specific places	“I'm setting up that land as a textbook: this tree has been here for 20 years.” (EC2)	Project timelines prevent the kind of sustained place-relationship that generates genuine ecological understanding
2. Embodied and material knowing	*Learning through hands, senses, transformation*	“Take this stone and grind the plant, the child is crushing, playing… in three years they become an expert.” (EC2)	SD pedagogy privileges visual-cognitive outputs; embodied knowing offers a different register of understanding

	Material behaviour as teacher	"I design activities where participants can observe, extract, test, and reflect, the material will respond in ways that cannot be fully predicted." (EC1)	Working with unpredictable living materials cultivates a tolerance for complexity and non-control that SD education tends to discourage
	Practical engagement over abstract description	"Knowledge should be practical, something you see and experience on a daily basis. Bring a flower to class, explain its origin, water it for six months." (EC3)	Ecological understanding cannot be produced through secondary representation alone; direct physical encounter is epistemologically necessary
3. Time, slowness, and cyclical duration	*Pedagogical value of slowness*	"Color doesn't reveal itself immediately, it requires time, and I see that as part of the pedagogy." (EC1)	SD project cycles are structured for efficiency; this theme asks what is lost when ecological learning is compressed
	Cyclical versus linear time	"What local farming knowledge shows is that you work with seasonal cycles, what grows when, what replenishes what." (EC3)	Linear project timelines prevent engagement with the cyclical patterns through which ecological systems actually function
	Continuity as condition of depth	"In the next three years, the child becomes an expert because they do this every day." (EC2)	Depth of ecological understanding depends on continuity of engagement; one-off activities or single lectures cannot produce this
4. Relational and communal learning	*Community as the unit of learning*	"Local people work as a community, you are part of the village, not a certain household." (EC3)	SD studio cultures are individualistic and competitive; communal learning structures produce different kinds of knowing

	Non-extractive relationship with knowledge	“I don't position myself as someone who transmits these knowledge systems, I learn from them and create spaces that honour their presence.” (EC1)	SD design processes tend to extract insights from communities; relational pedagogy models a different posture
	Educator as learner, not transmitter	“You become a learner instead of a knower.” (EC3)	The shift from educator-as-expert to educator-as-co-learner is fundamental to eco-centric pedagogical practice
5. Reciprocity and non-extractive engagement	*Responsibility toward sources of knowledge*	“How to engage with materials without exhausting them, how to acknowledge sources of knowledge, how to create a space where learning is not extractive but relational.” (EC1)	SD processes are structured around problem-solving for clients; reciprocal accountability toward places and communities is largely absent
	Giving back to communities and territories	“A researcher comes, writes a book, never acknowledges the community, never goes back, that is the common mistake.” (EC3)	Design education rarely asks students what they owe to the communities and ecosystems they engage with; reciprocity as a pedagogical principle addresses this directly
6. Positionality and limits of translation	*Educator's obligation to situate themselves*	“Before trying to integrate place-based pedagogies, educators need to reflect on how they relate to knowledge, land, and time.” (EC1)	SD education rarely asks educators to situate their own ecological relationship; positionality is treated as personal rather than pedagogically relevant

	Not everything is meant to be translated	“Some knowledge is private, some is communal, some is selective, not everything is meant to be public.” (EC3)	Frameworks that extract pedagogical principles risk losing the contextual specificity that gives those principles meaning; limits must be acknowledged

4.1.4 Synthesis of RQ1 Findings

Taken together, these themes do not describe a set of teaching techniques that can be adopted discretely. What they describe is a coherent pedagogical orientation, one in which the conditions of learning (where it happens, over what timescale, through what kind of engagement) are understood as inseparable from what is learned.

The most consistent message across all three participants is that ecological understanding cannot be produced through its representation; it requires direct, embodied, sustained encounter with living systems. This is a substantive challenge to the conditions of most higher education, including service design education, which delivers learning primarily through studio-based, screen-mediated, and cognitively oriented activity.

These findings respond directly to RQ1 by identifying not only what eco-centric pedagogical approaches exist but what epistemological commitments underlie them, commitments that must be understood if they are to inform a framework for service design education in a more than superficial way.

4.2 Interviews with Service Design Educators: Gaps and Structural Barriers (RQ2)

4.2.1 Introduction

The four service design educators interviewed for this research represent different institutional contexts and national settings: one is based at a Nordic university with an active interest in integrating sustainability into design research; one leads an international service design program with an art academy background; one holds a professorial position with an explicit focus on sustainability and systemic design; and one teaches service design basics with a pragmatic, business-oriented approach.

Together they offer a varied cross-section of how service design is currently taught in European higher education. Consistent with the interpretive approach described in Chapter 3, the aim of these interviews was not to evaluate individual educators but to understand through their accounts, the structural and pedagogical conditions that shape what service design education currently produces.

4.2.2 Observations

What is most significant in reading across these four interviews is not the absence of ecological awareness but the gap between awareness and practice. All four participants acknowledged, in different ways, that ecological thinking is not adequately embedded in their teaching. None attributed this primarily to personal indifference. What their accounts reveal instead is a set of structural conditions, project partner expectations, assessment frameworks, curriculum constraints, and the business logic that permeates most SD partnerships, that collectively reproduce an anthropocentric orientation even when individual educators would prefer otherwise.

SD4 articulates this gap with particular clarity: "Unless their outcome tackles some sustainability issue, I don't see any student that identified the nature or non-human element as one of the stakeholders." What is striking here is not simply that nature is absent from student work, but that it is absent even from the conditions that would make it possible to include: the learning outcomes, the partner briefs, the assessment criteria.

A second pattern that runs through all four interviews is the relationship between ecological integration and project context. Where sustainability appeared in student work, it was not because pedagogical conditions created it but because a particular project partner happened to request it, or because a student brought it from their own background. SD3 describes this dynamic: "In a housing project, not included.. but in a water project, explicitly." SD2 makes the same point about her own program: "It depends on the project... we never had a project where nature would be part of the stakeholders."

This project-dependency is the structural consequence of a curriculum built around external partnership briefs rather than around ecological commitments. What these observations collectively suggest is that ecological thinking in SD education is currently treated as optional content that appears when circumstances align, rather than as a foundational orientation that shapes how every project is approached from the outset.

4.2.3 Thematic Analysis

The themes presented in Table 3 were generated through the same reflexive thematic analysis process applied to the eco-centric educator interviews. Coding attended closely to two dimensions of each account: what educators currently do in relation to ecological thinking, and what they identify, explicitly or implicitly as preventing deeper integration. Six themes emerged from this process.

Four of these map directly onto gaps that the guiding principles in Chapter 5 are designed to address. The remaining two: structural and institutional barriers, and cultural and contextual variability do not produce principles directly but surface the conditions under which any framework for eco-centric integration must operate, and are returned to in the discussion in Chapter 6.

Table 3. *Thematic analysis of service design educator interviews (RQ2)*

Theme	Sub-theme	Supporting quote	Significance
1. Nature systematically absent from design processes	*Non-human entities excluded from stakeholder mapping*	“We never had a project where nature would be part of the stakeholders.” (SD2) “Unless their outcome tackles sustainability, I don't see any student that identified nature as a stakeholder.” (SD4)	Stakeholder mapping is the primary tool through which SD defines who counts in a design process; the systematic exclusion of non-human actors from this tool reproduces anthropocentrism structurally

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	Absence is project-dependent, not pedagogically addressed	"In a housing project, not included, but in a water project, explicitly." (SD3)	When ecological inclusion depends on project topic rather than pedagogical commitment, it cannot be a reliable feature of students' design practice
	No framework or method for including non-human actors	"We don't have any proper frame or model to incorporate sustainability into the service design project, even if I provide cases, not in a structured way, so students forget." (SD4)	The absence of structured pedagogical tools means that even motivated educators cannot reliably produce ecological thinking in students
2. Sustainability peripheral and add-on	*Sustainability as topic, not orientation*	"Sustainability often appears as one small thing, it depends on the project." (SD2)	Treating 'sustainability' as content that can be added or removed from a project reinforces the perception that it is optional rather than foundational
	Awareness does not translate to embedded practice	"In the last three to four years I've noticed a lot of shift and awareness, but whether that's enough, I don't feel in a position to judge." (SD3)	The gap between discourse and practice is acknowledged by educators themselves; growing awareness in the field has not yet translated into consistent pedagogical change
	Distinction between awareness and action	"Caring is one thing, action is another." (SD1)	Students may hold ecological values without being equipped to act on them within design processes; the framework needs to bridge this gap

3. Structural and institutional barriers	*Business partner logic dominates project briefs*	“The business partner doesn't see the huge value of sustainability in the project, when I ask what their design challenge is, they don't consider sustainability as the key issue.” (SD4)	Project-based curricula built around external partners transfer the values of those partners into the classroom; if partners are primarily commercially motivated, ecological priorities are systematically marginalised
	Time constraints prevent depth of ecological engagement	“Two years are a really short time... sustainability alone would cover one MA program or PhD.” (SD2)	The time limits the kind of sustained engagement that eco-centric learning requires; this structural constraint shapes what educators feel they can attempt
	Curriculum overload leaves no space for ecological integration	“I'm receiving so many interesting offers from lecturers, but we just cannot squeeze it in.” (SD2)	Ecological perspectives compete with established content priorities; without structural reorganisation, they are consistently displaced
	Assessment frameworks not designed for eco-centric outcomes	“The way we assess projects, like clarity of the problem, how rigorous the user research is, how feasible the solution is, it all kind of reinforces a human-centered way of thinking..” (SD4, paraphrased)	Assessment is where pedagogical values are enacted; if ecological outcomes are not assessed, they will not be consistently produced
4.Human-centred design as default worldview	*Design methods assume human-only stakeholders*	“Service design is coming from human-centred design, nature and agency are not actively involved.” (SD4)	The methods students are taught encode assumptions about who counts; changing those assumptions requires more than adding content

	Tools and methods treated as ends rather than means	"The focus on methods and tools has been a bit exaggerated — they have become a means in themselves rather than a means to an end." (SD3)	Over-reliance on standardised methods reduces design education to technique rather than cultivating the underlying orientations that methods should serve
	Nature appears as context or constraint, not as agent	"The ecological aspect... it should be there as one of the things you look into." (SD1)	Nature tends to appear as an additional consideration rather than as a central participant
5. Educator desire for structured pedagogical guidance	*Lack of frameworks for practical integration*	"If I know any philosophical frame or practical method for including sustainability, I can use it in teaching." (SD4)	Educators are not resistant to ecological integration but lack the concrete pedagogical tools to pursue it;
	One lecture as the current ceiling	"I would say it's just a question about one lecture, just opening up for students that a stakeholder can be nature." (SD2)	The current ambition for ecological integration in some programs extends only to a single awareness-raising lecture. While SD2 presents this as a reasonable starting point, other participants suggest it is insufficient: without structural embedding and a coherent framework, students revert to default human-centred approaches (SD4).
	Integration should begin at the research phase	"I would suggest at the beginning, in the research phase, because if it doesn't come in at the start, it's very difficult to add later." (SD4)	There is consensus among educators that ecological thinking must be embedded in the earliest stages of design process, not retrofitted at the end

6. Cultural and contextual variability	*Student background shapes ecological orientation*	“It depends on the cultural background of the student, in Latvia, we teach ecology from kindergarten.” (SD2)	Students bring very different ecological orientations from their backgrounds; pedagogical approaches cannot assume a common starting point
	Geographic and institutional context shapes what is possible	“In Finland, sustainability is a stronger value, implemented more strongly, it's more of a default.” (SD1)	The conditions for ecological integration in SD education vary significantly by national and institutional context.
	Economic development (privilege to think about sustainability)	“In India, people just need to survive, they don't have the time and money to think about sustainability the way we do in Finland.” (SD1)	The capacity to prioritise ecological thinking is not equally distributed; it is partly a function of economic security and development context.

4.2.4 Synthesis of RQ2 Findings

The picture that emerges from these interviews is not one of individual failure or resistance. Every participant interviewed expressed genuine engagement with the question of ecological integration and a personal sense that the field needs to move further in this direction. The findings reveal instead it is a structural problem: service design education is organised around conditions, external partnerships, semester timelines, assessment frameworks oriented toward human-centred outcomes, and methods that encode anthropocentric assumptions, which collectively reproduce ecological absence even when individual educators wish otherwise.

This is precisely the structural argument made in Section 2.1 of the literature review; the interview data confirms and deepens it with practitioner testimony. The gap is not primarily one of knowledge or motivation but of pedagogical infrastructure: the absence of frameworks, tools, and institutional conditions that would make ecological integration a reliable feature of service design education rather than an occasional accident.

4.3 Synthesis: From Thematic Analysis to Principles (RQ3)

4.3.1 Introduction: The third research question (RQ3), what guiding principles can support the integration of eco-centric perspectives in service design education is addressed through a deliberate synthesis of the findings from Sections 4.1 and 4.2.

The process involved identifying convergences between what eco-centric practitioners demonstrate as pedagogically powerful (RQ1) and what service design educators identify as structurally absent or underdeveloped in their teaching (RQ2). These convergences were then read in dialogue with the eco-centric pedagogical literature reviewed in Chapter 2 to confirm their theoretical grounding. Each convergence that emerged across empirical findings and literature constitutes a point at which an eco-centric pedagogical approach directly addresses a gap in current SD education and from each such point, a guiding principle was derived.

This is not a deductive process (principles imposed on data) nor a purely inductive one (principles emerging from data alone) but an abductive synthesis, moving iteratively between theoretical commitments and empirical findings to arrive at principles that are grounded in both.

Table 4. Synthesis matrix: From gaps and approaches to guiding principles (RQ3)

SD education gap (from RQ2)	***Eco-centric pedagogical approach (from RQ1 and Theoretical anchor from Literature)***	***Guiding principle (RQ3)***	
Nature systematically excluded from stakeholder maps and design processes; non-human entities treated as background context rather than participants with agency	Relational ontology positions all living entities as interconnected participants; learning happens through relationship with human and more-than-human others *(Biggs et al., 2024; Lynch & Mannion, 2021; eco-centric educator interviews)*	P1: Relational Thinking *(Who counts as a stakeholder?)*	SD education must cultivate the capacity to recognise and engage with more-than-human entities as active participants in design processes. Move from "nature as impact to minimise" to "nature as partners in design."
Learning confined to studios and screens; no sustained engagement with living environments; ecological understanding mediated entirely through secondary representation	Place-based learning positions land, territory, and specific environments as active participants in the learning process rather than as backdrop; learning happens from and with ecosystems directly *(Carpena-Méndez et al., 2022; Lynch & Mannion, 2021; eco-centric educator interviews)*	P2: Place as Teacher : *(Where do we learn from?)*	SD education must engage students with specific places and their ecological rhythms, such that ongoing engagement with living systems becomes core research method in design process.

Over-reliance on analytical frameworks, visual tools, and cognitive outputs; the body and senses are excluded from the knowing process; ecological understanding reduced to abstract representation	Embodied learning positions the body as the ground of ecological perception; direct sensory encounter with living materials and systems produces knowledge unavailable through abstraction *(Häggström, 2019; Merleau-Ponty, 1962; Pallasmaa, 2017 ; eco-centric educator interviews)*	P3: Embodied & Sensory Learning : *(How do we learn?)*	SD education must engage students with ecosystems through body, senses, and materials, not only through frameworks and presentations; physical participation in ecological observation and care creates deeper and more lasting understanding
Services designed as linear transactions without accountability for ecological impacts; design processes extract insights from communities and environments without reciprocal obligation.	Reciprocity as a relational principle holds that taking from ecological and social systems requires giving back; learning is structured as a circular rather than extractive process *(Kimmerer, 2014; EC1, EC3)*	P4: Cyclical Reciprocity: *(What does this service give back?)*	SD education must develop students' capacity to consider what services take from and owe to ecological and social systems, designing for reciprocal rather than extractive relationships

4.3.2. Four Guiding Principles

The four principles that emerge from this synthesis do not operate independently. They share an underlying commitment to what Chapter 2 identified as relational ontology, the understanding that humans exist within, not above or apart from, the living world, and that design thinking that does not begin from this premise is structurally limited in its capacity to address ecological realities.

Principle 1 addresses who is recognised as a participant in design; Principle 2 addresses addresses where learning happens and what counts as a legitimate learning environmen; Principle 3 addresses how ecological knowledge is cultivated, through what modes of engagement and what relationship between body, senses, and understanding; and Principle 4 addresses what obligations design practice carries toward the systems it engages with.

Together, they constitute not a methodology but an orientation, a set of pedagogical commitments that, if embedded in service design education, would begin to address the structural gaps identified in Section 4.2. Chapter 5 develops each principle in full, articulating its theoretical grounding, its practical implications for SD teaching, and the questions it asks educators and students to engage with.

5. GUIDING PRINCIPLES FOR INTEGRATING ECO-CENTRIC PERSPECTIVE IN SERVICE DESIGN EDUCATION

5.1 Introduction

This chapter addresses the third research question (RQ3) directly: what guiding principles can support the integration of eco-centric perspectives in service design education? The four principles presented here are not hypothetical propositions. They emerged from the synthesis process described in Section 4.3, each one identified at a point of convergence between a consistently documented gap in service design pedagogy (RQ2) and a pedagogically grounded eco-centric approach (RQ1), and each one is anchored in both the empirical data from the interviews and the theoretical framework established in Chapter 2.

What binds the four principles is the philosophical foundation established in Section 2.3.1: relational ontology. All four proceed from the premise that humans do not exist as separate from the living world but as part of it, embedded in ecological systems, constituted through relationships with other-than-human beings, and therefore responsible to those relationships in ways that conventional human-centred design education does not address.

Relational ontology is not one principle among the four, it is the shared ground from which all four grow. The diagram below (Figure 6) illustrates this structure, relational ontology as the common foundation, and the four principles as the four dimensions of pedagogical practice that must shift if eco-centric thinking is to be genuinely cultivated in students.

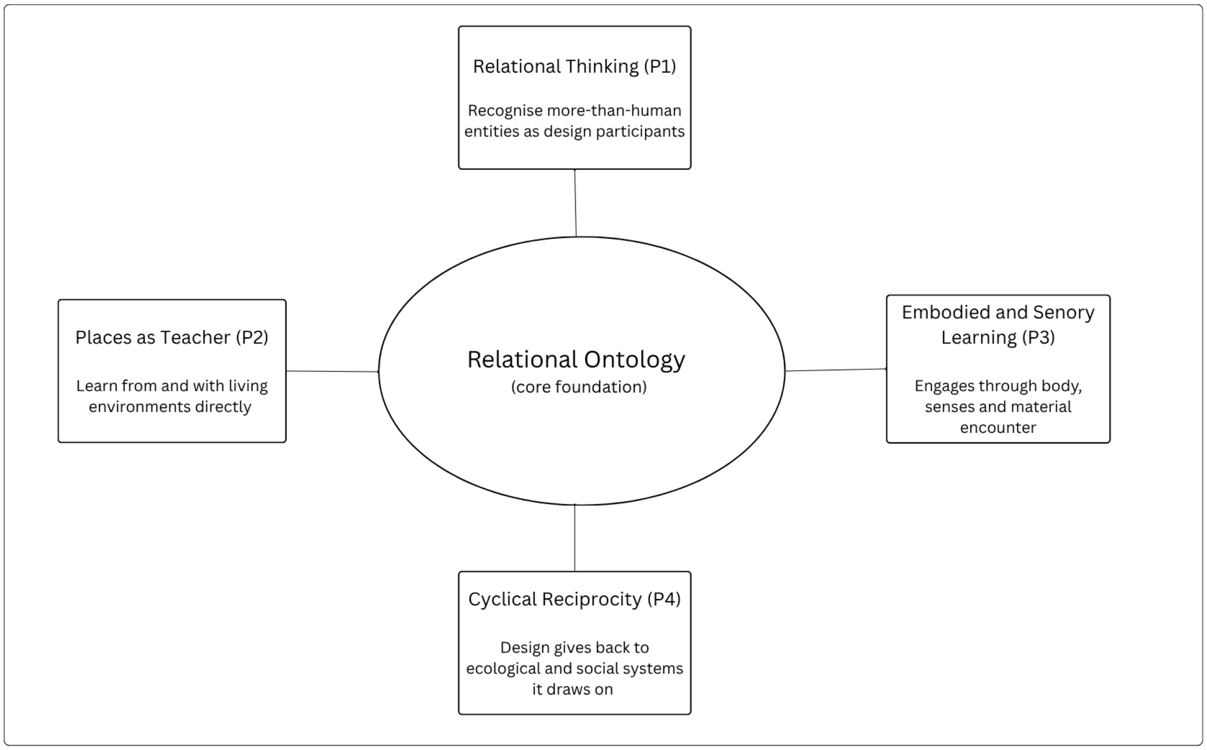
Relational Thinking (P1)
Recognise more-than-human entities as design participants
Places as Teacher (P2)
Learn from and with living environments directly
Relational Ontology
(core foundation)
Embodied and Senory Learning (P3)
Engages through body, senses and material encounter
Cyclical Reciprocity (P4)
Design gives back to ecological and social systems it draws on

FIGURE 6: *Guiding Principles for eco-centric service design education with relational ontology as shared foundation*

The four principles address four distinct and non-overlapping questions:

- Principle 1 addresses **who** is recognised as a participant in design, expanding the boundaries of stakeholding to include more-than-human entities.
- Principle 2 addresses **where** learning happens, moving from studios and screens into direct engagement with living environments and specific places.
- Principle 3 addresses **how** knowledge of ecological systems is cultivated, through the body, senses, and material engagement rather than through cognitive abstraction alone.
- Principle 4 addresses **what obligations** design practice carries, toward the ecological and social systems it depends on and affects.

These dimensions are presented as principles, rather than as a sequence. They are mutually reinforcing and intended to operate together; an educator engaging with any one of them will find that it naturally draws the others into consideration. No principle is more foundational than the others, and none is optional.

5.2 Principle 1: Relational Thinking

5.2.1 What It Is and Where It Comes From

The first principle addresses the most foundational question in service design: who counts? Current SD education answers this question implicitly and consistently, humans count. Stakeholder maps, user research, persona development, journey mapping, each of these tools is structured around the assumption that the relevant participants in any design process are human beings with identifiable needs, behaviours, and experiences. Non-human entities like rivers, soil communities, pollinators, forests, animal populations appear in this framework, if at all, as environmental context or sustainability constraint rather than as actors with their own agency, interests, and claims on the design process.

The principle of relational and ecological stakeholding challenges this assumption directly. It draws on the relational ontological position established in Section 2.3.1, the premise that all entities, human and non-human, exist in webs of interdependence and on the more-than-human design scholarship reviewed in Section 2.4, which has begun to develop both the theoretical grounding and the practical methods for treating non-human entities as genuine design participants. The eco-centric educators interviewed for this research demonstrated this orientation in practice: EC3 described how communities in forest-dwelling areas understood themselves as living with trees and rivers rather than adjacent to them, and how that relational understanding structured what counted as a design problem and what counted as a solution. EC1 framed it as a shift in perception: from seeing the territory as background to the learning, to recognising it as an active participant in it.

What relational thinking requires the recognition that design processes do not take place in a human social world that exists separately from the ecological one. They take place within living systems, and those living systems have stakes in design outcomes that are no less real for being difficult to represent through conventional design tools.

The systematic exclusion of non-human entities from stakeholder mapping identified in Section 4.2 establishes the practical starting point for this principle: if the tools educators use do not make ecological actors visible, those actors will not appear in student work regardless of how committed individual educators are to ecological thinking.

5.2.2 What It Looks Like in Practice

In practice, this principle asks educators to reframe the initiating question of stakeholder analysis. Rather than asking "who are the human users, providers, and regulators of this service?", the question becomes "what living systems, human and more-than-human does this service touch, depend on, or affect, and what are the stakes of those systems in the design outcome?"

- One concrete tool for enacting this shift is the Actant Mapping Canvas (Sznel & Lewan, 2020), which helps students identify both human and more-than-human participants, termed 'actants', across a service lifecycle, distinguishing between those who affect the design challenge directly and those who affect it through their relationships with others. Unlike conventional stakeholder maps, the canvas makes ecological actors concrete and discussable within design conversations without requiring students to have specialist ecological expertise.
- The important shift is not comprehensiveness but habit. Students should learn to ask about non-human participants as a default, not only when the project topic makes it unavoidable. EC3 captured this in her account of teaching with plants, bringing a plant into the classroom and asking students to learn about its ecological role was not a botany lesson, but a practice in expanding the circle of what counts as a participant in the design environment.

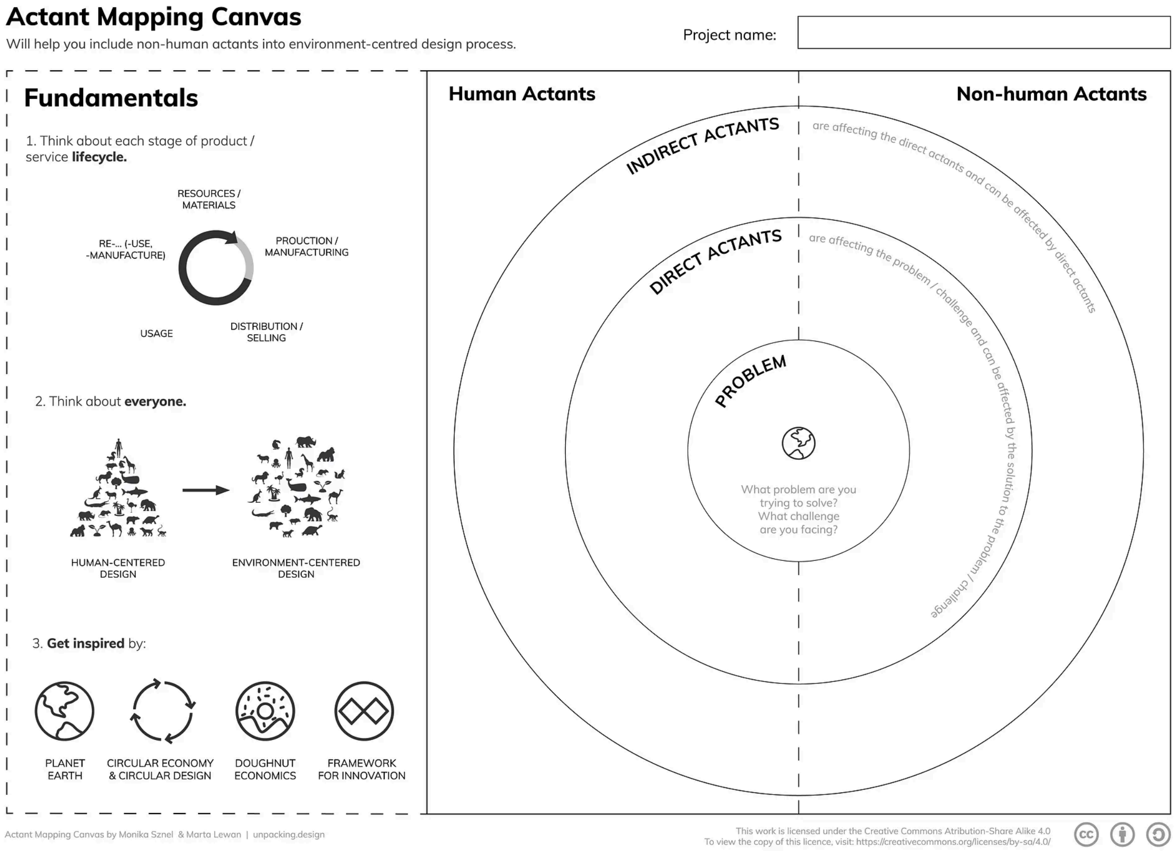
Actant Mapping Canvas
Will help you include non-human actants into environment-centred design process.
Project name:
Fundamentals
1. Think about each stage of product / service lifecycle.
RESOURCES / MATERIALS
PROUCTION / MANUFACTURING
DISTRIBUTION / SELLING
USAGE
RE-... (-USE, -MANUFACTURE)
2. Think about everyone.
HUMAN-CENTERED DESIGN
ENVIRONMENT-CENTERED DESIGN
3. Get inspired by:
PLANET EARTH
CIRCULAR ECONOMY & CIRCULAR DESIGN
DOUGHNUT ECONOMICS
FRAMEWORK FOR INNOVATION
Human Actants
Non-human Actants
INDIRECT ACTANTS
are affecting the direct actants and can be affected by direct actants
DIRECT ACTANTS
are affecting the problem / challenge and can be affected by the solution to the problem / challenge
PROBLEM
What problem are you trying to solve? What challenge are you facing?
Actant Mapping Canvas by Monika Sznel & Marta Lewan | unpacking.design
This work is licensed under the Creative Commons Atribution-Share Alike 4.0
To view the copy of this licence, visit: https://creativecommons.org/licenses/by-sa/4.0/

Figure 7: *Environment-centred actant mapping process by Monika Sznel and Marta Lewan, 2020*

Note: *The actant mapping canvases can help you map all of the human and non-human stakeholders of your project, product, or service. This tool was created by Monika Sznel and Marta Lewan. Source: Sznel, M. (2020, May 25). Tools for environment-centered designers: Actant Mapping Canvas. UX Collective.*

- Respectful positioning inquiry: The principle also requires educators to introduce a prior question that conventional SD education tends to skip, before asking how to design, students should be asked whether and on what grounds they have the right to intervene in the particular ecosystem or community their project concerns. This is not an abstract ethical exercise, it is a design question with practical consequences. Students who research what an ecosystem or community actually needs, who already cares for it, and what existing relationships and knowledge systems are present, make better and more grounded design decisions than those who arrive with predetermined solutions. As EC1 articulated in her own practice, the posture of the designer must shift from expert who intervenes to learner who attends and sometimes the most honest design outcome is the recognition that a design intervention is not what the situation requires.

5.2.3 Reflective Questions for Educators

- When you ask students to map stakeholders, what question initiates that process? Does that question make non-human entities visible or invisible by default?
- In the project briefs you set or accept from partners, what counts as a design success criterion? Is ecological impact positive or negative part of that evaluation?
- Are ecological participants identified in every project by specific name, which river, which soil community, which pollinator population rather than by the generic term "environment" or "nature"?
- When students present design solutions, are they asked to account for non-human impacts alongside human ones?

5.3 Principle 2: Place as Teacher

5.3.1 What It Is and Where It Comes From

The second principle addresses where learning happens and what that spatial context produces. Place-based learning, as established in Section 2.3.3, proceeds from a different premise: that specific places, forests, rivers, urban ecosystems, agricultural landscapes are not merely settings for human activity but active participants in it, with their own patterns, agencies, and ways of teaching that cannot be encountered through secondary representation.

The distinction Lynch and Mannion (2021) draw is precise: place as resource for curriculum versus place as teacher. In the former, the local environment provides content that a classroom can then work with. In the latter, the place itself demands a kind of attention, responsiveness, and relational engagement that classrooms structurally prevent.

All three eco-centric educators in this study demonstrated this principle in their practice. EC1 described beginning every educational experience by attending to the territory, its seasonal state, its available plants, its particular ecological character, rather than to any predetermined curriculum. EC2 described setting up a specific piece of land as a textbook: a resource that taught through its own structures and dynamics rather than through a teacher's interpretation of them. This is not a romantic or nostalgic position, it is a pedagogical claim about where certain kinds of knowledge can and cannot be produced.

The finding in Section 4.2 that SD learning is confined almost entirely to studios and screens with field research targeting human users rather than the living environments through which those users move identifies precisely the condition this principle is designed to address.

5.3.2 What It Looks Like in Practice

- Ecosystem observation as research method: In practice, this principle invites educators to structure direct ecosystem observation as a legitimate research method within the design process, as a component of the research phase that carries the same weight as stakeholder interviews or secondary research. This means asking students to spend a minimum of thirty to sixty minutes in direct observation of an ecosystem relevant to their project: documenting what species are present, what relationships exist between them, what appears to be thriving and what shows signs of stress, and what patterns emerge across repeated visits. The knowledge produced through this kind of observation is qualitatively different from what secondary research provides, it is context-specific, responsive, and grounded in the particularity of a place rather than in generalisations about ecosystems as a category. As EC2 described, once a piece of land becomes a textbook, what it teaches cannot be reproduced by reading about it.
- Sit spot practice: students choose one specific location within a relevant ecosystem and return to it regularly throughout the duration of a project, weekly if possible, at different times of day and in different weather conditions. Each visit involves observation without intervention, attending to what changes and what remains constant, noticing patterns that only become visible across time. EC1's description of her own pedagogical practice captures what this kind of sustained engagement produces, an attunement to the rhythms and dynamics of a place that shapes design decisions in ways that data collection alone cannot. Over the course of a semester this is necessarily compressed, but even four or five structured returns to the same site produce a qualitatively different relationship with

place than a single field visit. The principle does not require wilderness; urban parks, riverside paths, community gardens, and ordinary patches of local ecology all function as places of learning when the intention is genuine attentiveness rather than data extraction.

5.3.3 Reflective Questions for Educators

- Where does learning in your courses physically happen? What knowledge does that location make available and what knowledge does it prevent?
- When students conduct field research, is the living environment itself part of what they are researching, or only the humans who move through it?
- Does your project structure allow for repeated return to the same place, or only single visits? What would sustained engagement make visible that one-off observation cannot?

5.4 Principle 3: Embodied and Sensory Learning

5.4.1 What It Is and Where It Comes From

The third principle addresses how knowledge of ecological systems is cultivated through what modes of engagement and what relationship between the body, the senses, and understanding. Service design education is predominantly cognitive in its orientation: reading, analysing, synthesising, mapping, presenting. As Section 2.2 established, this reflects the first of Bai et al.'s (2009) axes of disconnection: the treatment of the body as a vehicle for the mind rather than as its ground.

Embodied learning, as reviewed in Section 2.3.2, proceeds from the phenomenological insight that perception is always already bodily that we do not first understand the world cognitively and then experience it bodily, but rather know the world through the lived responsiveness of the organism to its environment (Merleau-Ponty, 1962). The implications for ecological education are significant. Ecological systems are sensory realities: the texture of soil, the sound of a forest, the weight of water, the smell of decomposition. These are not supplementary to ecological understanding; they are constitutive of it. The kind of ecological attunement that enables designers to genuinely care about non-human systems cannot be produced through data analysis alone; it must, at some level, be felt.

The eco-centric educators in this study demonstrated this consistently. EC1 described natural dye practice as pedagogy precisely because it requires sustained physical engagement with living materials whose behaviour cannot be fully predicted or controlled: "The material itself will respond in ways that cannot be fully predicted." EC2 described children developing genuine expertise through years of daily physical practice grinding plants, tending crops, learning through repetition and sensory feedback. EC3 described giving students a plant to care for over six months as a mode of ecological education that a lecture could not replicate: the knowledge produced through sustained physical relationship with a living thing is qualitatively different from knowledge produced through description of it.

As the findings in Section 4.2 establish, SD pedagogy evaluates learning through cognitive outputs and the body enters the design studio primarily as a producer of those outputs rather than as a site of knowing in its own right, this is the condition the following approaches are designed to shift.

5.4.2 What It Looks Like in Practice

- Sensory ecosystem engagement: In practice, this principle asks educators to design learning experiences in which students engage with ecological systems through their senses as a mode of inquiry rather than as a supplement to analytical work. Sensory ecosystem engagement involves attending to an environment through multiple channels simultaneously. This produces data about ecosystem conditions that charts and reports cannot capture, and it trains students to notice through their bodies what analytical tools are not designed to detect. EC1's account of natural dye practice as pedagogy rests on precisely this claim, working with living materials whose behaviour cannot be fully predicted or controlled produces a quality of attention and ecological understanding that observation at a distance cannot replicate. "The material will respond in ways that cannot be fully predicted," she noted and learning to respond to that responsiveness is itself a form of ecological education.
- Physical participation in the contexts where services operate extends this principle into the design process more broadly. If students are designing for urban mobility, they should walk the routes, noticing how surfaces affect movement, what air quality and sound feel

like across different sections of the journey. If they are designing for food systems, they should handle ingredients, work alongside the people who prepare and distribute them, and understand material flows through physical engagement rather than through supply chain diagrams alone. EC2's description of children developing genuine expertise through daily physical practice, crushing plants, tending crops, learning through sensory repetition holds as a principle across contexts: embodied engagement with any environment, undertaken consistently and attentively, produces forms of understanding that no amount of secondary research can substitute for. The implication for assessment is also worth noting: if physical, sensory, and material engagement is valued as a mode of inquiry, then assessment forms should create space for students to demonstrate what they have learned through those modes, not exclusively through written reports and slide presentations.

5.4.3 Reflective Questions for Educators

- In your courses, what role does the body play in learning? Is it a site of knowing or a vehicle for producing cognitive outputs?
- When students engage with ecological or environmental aspects of a brief, is that engagement primarily analytical (reading, mapping, presenting) or does it involve direct sensory encounter with living systems?
- What would it take to include at least one learning experience per semester in which students engage with a living ecological system through their bodies rather than through secondary representation?
- What do you think students cannot know about ecological systems unless they feel them?

5.5 Principle 4: Cyclical Reciprocity

5.5.1 What It Is and Where It Comes From

The fourth principle addresses what design practice owes to the ecological and social systems it draws on, affects, and depends upon. Service design, as noted in Section 2.1, has its origins in improving services for users and providers within market contexts. Even as the field has expanded toward social innovation, public services, and sustainability, its underlying structure remains broadly extractive: designers enter a context, research it, identify problems, propose solutions, and exit. The relationship between the design process and the system it intervenes in is fundamentally unidirectional, knowledge flows in, a solution flows out, and the designer's accountability ends at project delivery.

Eco-centric pedagogical practice offers a fundamentally different orientation: reciprocity. The principle that taking from ecological or social systems creates an obligation to give back that relationships with places, communities, and more-than-human entities are ongoing rather than transactional runs through all three eco-centric educator accounts in this study. EC1 articulated this as a design principle for her own practice: "How to engage with materials without exhausting them, how to acknowledge sources of knowledge, how to create a space where learning is not extractive but relational." EC3 described the failure of researchers who take knowledge from communities without going back, without building anything, without acknowledging the source. EC2 described designing land-based learning environments in terms of what the design gives back to the land rather than what it takes from it.

This principle finds its theoretical grounding in the ecological concept of reciprocity the understanding that sustainable relationships between humans and the living world are characterised by exchange, by cycles of giving and receiving, rather than by accumulation and extraction. As Kimmerer (2014) argues, this is not sentimentality; it is ecological reality. Systems that operate on extractive logic without reciprocal replenishment degrade. Design education that trains students only to take from communities and ecosystems knowledge, insights, inspiration without attending to what is owed back is training them for a practice that is ecologically and socially unsustainable.

5.5.2 What It Looks Like in Practice

- Map what service takes and what it gives: In practice, this principle asks educators to build a reciprocity audit into the design process as a structural requirement rather than an optional reflection. The audit involves asking students to explicitly identify both sides of the exchange their proposed service creates: what does this service take from ecological and social systems and what does it return? This makes invisible resource flows visible and creates an obligation to address imbalance. Mapping the full lifecycle of a service in terms of what it extracts and what it replenishes is itself a form of ecological literacy. Importantly, this analysis sometimes leads to the conclusion that the service should not exist in its proposed form or that not designing is the more ecologically responsible choice. SD education rarely creates space for that conclusion, and the reciprocity audit provides a structural means of reaching it honestly rather than through refusal to engage.

- Design for Regeneration: Beyond auditing what exists, this principle invites educators to push students toward designing for regeneration rather than merely for reduced harm. The distinction matters: sustainability framing asks "how do we minimise environmental impact?", while regenerative design asks "how does this service actively improve the ecological and social systems it touches?" When a service engages a community in its research process, does it leave that community with greater capacity to address its own challenges, or does it extract insights and exit? When materials flow through a service, do they return to replenish their source systems, or do they become waste? EC3's account of researchers who take knowledge from communities and never go back captures what the absence of reciprocity looks like in practice: eroded trust, degraded conditions for future engagement, and knowledge that has been used without acknowledgment. The regenerative framing asks students to design against that pattern to understand their practice not as an intervention that ends at delivery but as a relationship that carries ongoing obligations.

5.5.3 Reflective Questions for Educators

- In the projects your students conduct, is there a moment at which they are asked what the design process has taken from the communities and ecosystems they have engaged with, and what it therefore owes?
- What would it mean to include ecological reciprocity as an explicit design success criterion alongside user experience and commercial viability?
- How might you structure a post-delivery reflection in which students ask not just "did our design work?" but "did our design give back more than it took?"

5.6 Implementation Considerations

5.6.1 How the Principles Work Together

The four principles are not a sequence to be followed but a set of mutually reinforcing orientations. In practice, they tend to activate one another. An educator who begins by expanding stakeholder identification to include non-human entities (Principle 1) will quickly find that understanding those entities requires direct engagement with the places they inhabit (Principle 2) and sensory encounter with the living systems they are part of (Principle 3). And taking the obligations of that engagement seriously, asking what design owes to the communities and ecosystems it draws on follows naturally from the relational stance that Principles 1, 2, and 3 together cultivate (Principle 4).

The underlying coherence of the four principles addresses the separation model that Bai et al. (2009) identify as the root of the three axes of disconnection discussed in Chapter 2. Each principle, in a different way addresses the separation between designer and world, between design process and ecological consequence, between taking and giving back. Together they create a different relationship between designer and living world, one in which design is understood as participation in ecological systems rather than intervention upon them.

5.6.2 Structural Conditions and Realistic Starting Points

The structural barriers identified in Section 4.2 are real and significant, and any honest account of this framework must acknowledge them. Business partner briefs are unlikely to change overnight. Semester timelines cannot be stretched to accommodate ecological cycles. Assessment frameworks are not easily redesigned. These constraints do not render the principles unworkable, but they do shape what implementation looks like in practice.

The principles do not require wholesale curricular transformation. It asks for a shift in orientation, in the questions that structure teaching, in the criteria by which design work is evaluated, in the awareness that educators bring to the pedagogical choices they make within existing structures. Even within a semester-long business partnership project, an educator can ask students to include non-human stakeholders in their mapping, can take one session outdoors, can include a reciprocity audit in the final presentation criteria. These are not comprehensive implementations of the framework, but they are genuine moves in the direction it points.

The cultural and contextual variability identified in Section 4.2 also matters here. Students arrive at service design programs from very different ecological backgrounds, some from contexts where nature education is embedded from early childhood, others from contexts where survival priorities have made ecological awareness a secondary concern. The framework cannot assume a common starting point, it requires educators to understand the diversity of ecological orientations their students bring and to design pedagogical approaches that are responsive to that diversity rather than demanding uniform ecological commitment.

6. DISCUSSION & IMPLICATIONS

This chapter draws together the findings and guiding principles to address what they collectively mean, the contribution this research makes, what they imply for practice, and what they cannot claim. It returns explicitly to the three research questions, positions the study's contributions relative to existing work, states its limitations honestly, and identifies directions future inquiry might take from here.

6.1 Addressing the Research Questions

RQ1: What pedagogical approaches exist in eco-centric education that could inform service design teaching?

The interviews with Educators working with eco-centric pedagogical approaches and literature reviewed in Chapter 2 converge on a coherent answer: Eco-centric pedagogical approaches are grounded in direct, embodied, and relational engagement with living environments, and they share a commitment to the premise that ecological understanding cannot be produced through secondary representation alone. The themes that emerged across all three practitioner interviews: place and territory as active teachers, embodied and material knowing, time and slowness as pedagogically constitutive, relational and communal learning, and reciprocity as a design principle, are not isolated techniques but expressions of a consistent epistemological orientation. This orientation, grounded in relational ontology (Barad, 2006; Haraway, 1988), holds that knowledge of the living world is produced through sustained, attentive relationships with it, not through observation at a distance. The approaches that enact this orientation: place-based observation, sensory and material engagement, sit spot practices, and reciprocity audits (approaches detailed in chapter 5) are specific enough to be implemented within higher education contexts and distinctive enough from existing SD methods to constitute a genuine pedagogical contribution to the field.

RQ2: What challenges and gaps do service design educators face in integrating eco-centric perspectives into their teaching?

The interview findings with SD educators establish clearly that the gap is structural/systematic rather than attitudinal. All four SD educators expressed genuine awareness of the need for ecological integration and personal commitment to moving in that direction. What prevents it is a set of self-reinforcing institutional conditions: project partner briefs that prioritise commercial outcomes over ecological ones, semester timelines that cannot accommodate the cyclical and relational tempo that eco-centric learning requires, assessment frameworks that evaluate only human-centred outputs, and the absence of any pedagogical infrastructure like tools, frameworks, or established practices that would make ecological thinking a reliable feature of design processes rather than an occasional accident. The gap is not what educators know or value but what the conditions of their teaching make possible. This finding confirms and extends the structural argument made in the literature by Irwin et al. (2020) and by the MOVA project's own evaluation (Bekker et al., 2023; Nilsson et al., 2025): the pedagogical shift required is not a content addition but a reorientation of the conditions in which learning takes place.

RQ3: What guiding principles can support the integration of eco-centric perspectives in service design education?

The synthesis of RQ1 and RQ2 findings produced four guiding principles, each emerging from a convergence between a consistently documented SD gap and a grounded eco-centric approach: relational and ecological stakeholding (who is recognised as a design participant), place as teacher (where learning happens), embodied and sensory learning (how ecological knowledge is cultivated), and cyclical reciprocity (what obligations design practice carries). These four principles constitute an orientation, a set of pedagogical commitments grounded in both empirical data and the theoretical framework of relational ontology that, taken together, address the structural conditions that currently reproduce ecological absence in SD education.

6.2 Contributions of the Research

6.2.1 Theoretical Contribution

This research makes a specific theoretical contribution by bridging two bodies of work that have developed largely in parallel: eco-centric pedagogy and service design education. This thesis argues, and the findings support, that the pedagogical gap in existing frameworks is not a minor omission but a structural, without the conditions that eco-centric pedagogical approaches have developed for cultivating ecological perception and relational understanding, the theoretical commitments of more-than-human design education cannot be reliably translated into how students actually learn to relate to the living world.

6.2.2 Practical Contribution

The framework of four guiding principles developed in Chapter 5 constitutes a practical contribution to service design education. It synthesises eco-centric pedagogical approaches specifically for SD educators, offering principles with concrete integration approaches, reflective questions, and honest acknowledgment of the structural conditions that shape implementation. Crucially, the framework is grounded not only in literature but in practitioner testimony from both eco-centric educators and SD educators, which means it addresses the conditions educators actually face rather than the conditions an ideal framework would assume.

The interviews also surfaced a broader implication that extends beyond higher education, several eco-centric practitioners noted that genuine ecological orientation is difficult to cultivate when first introduced at master's level, precisely because students have spent years being educated within systems that reproduce the disconnections described in Chapter 2. This points toward the need for eco-centric approaches to be embedded earlier in primary and secondary education so that higher education can deepen an existing relationship with the living world rather than attempt to establish one from scratch.

6.2.3 Methodological contribution

The two-group interview design, bringing eco-centric practitioners and SD educators into dialogue through a synthesis process produces a kind of knowledge that neither group alone could generate. The abductive synthesis approach described in Section 3.4.3 moves iteratively between theoretical commitments and empirical findings to identify convergences that are grounded in practice on both sides. This methodological approach offers a model for research at the intersection of educational traditions that do not normally engage with one another.

6.3 Implications for Practice

For Service Design educators: The most immediate implication is that eco-centric integration does not require wholesale curricular transformation. The principles are designed to be usable within existing structural constraints. An educator who cannot redesign their entire program can still reframe the initiating question of stakeholder analysis, structure one research phase session as direct ecosystem observation, or add a reciprocity audit to final presentation criteria. These are small moves, but they are genuine moves toward ecological reorientation rather than surface gestures. The reflective questions at the end of each principle section in Chapter 5 are intended as practical starting points for this kind of incremental engagement.

For program directors and curriculum designers: The structural barriers identified in Section 4.2 cannot be addressed by individual educators alone. They require institutional decisions, about what kinds of project partners are acceptable, about what assessment criteria include, about whether learning outcome statements reference ecological responsibilities alongside human-centred ones. The finding that educators consistently described wanting a structured framework but not knowing how to proceed without one suggests that institutional support in the form of resources, pedagogical development, and legitimising ecological integration as a program-wide priority is a necessary condition for the principles to move from individual practice into structural change.

For the service design field: The systematic exclusion of ecological perspectives from SD education's tools, methods, and assessment frameworks has implications that extend beyond pedagogy. Service designers trained without any grounding in ecological relationships will continue designing services that treat the living world as a resource rather than a participant. The field's increasingly prominent positioning in relation to public sector challenges, climate emergency, and planetary boundaries (Irwin et al., 2020) makes this gap increasingly consequential. The guiding principles proposed here contributes to closing it, but the broader implication is that the field needs to take ecological literacy as seriously as it currently takes user research.

6.4 Limitations of the Study

The sample is small with seven participants in total, which limits the depth and range of what the findings can claim. While the four SD educators represent different European institutional contexts, they do not reflect the diversity of service design education globally that might operate under different structural conditions, partner ecosystems, and cultural relationships to ecological thinking, none of which this study can speak to. The eco-centric educator group, while geographically broader, is small enough to be considered representative of the range of eco-centric pedagogical approaches that exist. The result is that the framework developed here is grounded in a specific and limited set of practitioner experiences, and its claims should be understood as contextually bounded rather than generalisable.

The research captures educator perspectives only. What students experience when eco-centric principles are implemented, whether the approaches produce the ecological understanding they are intended to cultivate, and how students from different backgrounds respond remains unknown. The framework is grounded in what educators believe and intend, which is not the same as what students learn.

The research is cross-sectional rather than longitudinal. It documents conditions at a point in time and cannot speak to what happens when educators attempt to implement the principles over sustained periods. The framework is a starting point, not a tested intervention.

Lastly, the researcher's own positionality shapes what was asked and how it was interpreted. As a service design student with a background in plant science, coming from a non-European cultural context and conducting research in Finland, the perspective brought to this analysis is specific. The framework reflects that specificity and should be read with that in mind.

6.5 Directions for future research

Four directions for future inquiry follow directly from these limitations and from what the findings themselves opened.

The most pressing gap is the student perspective. Future research should examine what students actually experience when eco-centric pedagogical approaches are introduced in SD courses, whether embodied engagement with ecological systems produces the relational understanding the framework claims, and how students from different cultural and economic backgrounds engage with principles that assume different starting relationships with the living world.

Longitudinal implementation studies are needed. The guiding principles proposed here has not been implemented and evaluated over time. Research that follows educators as they attempt to integrate the principles across full semesters or academic years would produce the kind of practical knowledge that this study, by its design, cannot.

The relationship between eco-centric design education and decolonial design practice deserves sustained attention. The principles acknowledges this dimension in Section 5.6.3 but does not address it fully. Future research at this intersection examining how ecological stakeholding, place-based learning, and reciprocal design orientation relate to the decolonisation of design methods and curricula would enrich the theoretical grounding of the framework considerably.

Cross-cultural comparative work would test the principle's adaptability claims. The cultural and contextual variability documented in Section 4.2 raises genuine questions about how the principles operate in contexts outside European higher education, in design programs embedded in very different ecological, economic, and educational conditions. Research in those contexts would both stress-test the principles and potentially extend it.

7. CONCLUSION

This thesis set out to address a specific and documented gap, service design education operates from a foundational anthropocentrism that renders the living world structurally invisible, and while existing frameworks such as MOVA (Nilsson et al., 2025) and Transition Design (Irwin et al., 2020) have begun to address this theoretically, none has drawn on eco-centric pedagogical approaches to provide the practical conditions through which that shift might actually be cultivated in learners. Through a qualitative study combining a literature review and semi-structured interviews with seven participants across two groups, service design educators and practitioners of eco-centric pedagogical approaches, this research examined what eco-centric education offers, what SD education currently lacks, and what a synthesis of the two might look like in practice.

The findings confirmed that the gap in SD education is structural, educators are aware of the need for ecological integration but lack the pedagogical infrastructure to pursue it reliably. They simultaneously established that eco-centric pedagogy offer practitioner-grounded approaches like place-based learning, embodied and sensory engagement, relational learning, reciprocity as a design principle, that directly address the conditions producing that gap. From the synthesis of these two sets of findings, four guiding principles emerged: relational thinking, place as teacher, embodied and sensory learning, and cyclical reciprocity. These four principles, developed in Chapter 5, constitute the primary contribution of this research.

The principles proposed here synthesises eco-centric pedagogical approaches specifically for service design educators, through the synthesis of practitioner testimony from both fields alongside the theoretical literature. It proposes an orientation, a set of grounded commitments about who counts in design, where learning happens, how ecological knowledge is cultivated, and what obligations design practice carries that educators can begin to enact within existing structural conditions. Each principle is supported by both empirical findings and theoretical grounding, and each is accompanied by concrete integration approaches and reflective questions designed to make the principle usable rather than aspirational. The framework contributes to the field not by resolving the problem of ecological absence in SD education but by providing the pedagogical vocabulary and practical starting points.

The implications of this research extend beyond its immediate scope. The structural conditions that produce ecological absence in SD education, the prioritisation of human needs, the abstraction of learning from living environments, the treatment of design as extraction rather than reciprocal engagement are not specific to service design. They characterise design education broadly, and arguably higher education more broadly still. The Bai et al. (2009) framework of three axes of disconnection, which this thesis applied to SD education, speaks to conditions that extend well beyond a single discipline. The eco-centric pedagogical approaches this research draws on were developed wherever educators have recognised that genuine understanding of the living world requires genuine relationship with it. The principle proposed here is a service design application of a much wider pedagogical argument, one that becomes more urgent as higher education institutions increasingly position themselves in relation to ecological crisis while continuing to reproduce through their pedagogical structures, the disconnection that crisis demands we address.

Service design has expanded its ambitions considerably in recent years from improving customer experiences to addressing public sector challenges, social inequity, and climate emergency. The field's tools and methods have not kept pace with those ambitions. Designers trained to see only human stakeholders, and to treat their interventions as transactions with no ongoing ecological obligation. The proposed outcomes from this mindset are not equipped to work on problems that are, at their root, about the relationship between human systems and the living world they depend on.

This thesis does not claim to resolve that mismatch. It claims that the resolution begins with how designers are educated with what they are taught to notice, to value, and to feel responsible for. The four principles proposed here are a starting point for educators willing to ask those questions seriously. The living world, as the eco-centric educators in this research made clear, has always had things to teach. The question is whether design education is willing to learn

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APPENDICES

Appendix 1. Interview questions for Educators working with Eco-centric Pedagogies

Understanding Context and Practice

- Can you tell me about yourself and your work - specifically how it engages with eco-centric, nature-based, or place-based approaches in education?
- What pedagogical traditions or approaches do you work with, and how did you come to this work?
- In your experience, what are the core principles or values that guide how knowledge is shared and learned in eco-centric or nature-based educational contexts? How is this different from typical university classrooms?
- When you're preparing to teach - whether that's planning a class, designing an activity, or preparing for time with students - what guides your thinking? What do you attend to or prioritise?
- In many eco-centric knowledge systems, land and natural elements are understood as teachers. How does this show up in educational practice? Can you share an example? How do you help students develop this capacity to learn from nature or place?
- What challenges or tensions do you experience when practising eco-centric or nature-based pedagogies within Western institutions like universities? What gets lost or compromised?

Learning from Relational Approaches

1. What does relationship-building with nature or place actually look like?
2. If you were advising an educator who wanted to start integrating eco-centric or nature-based approaches to cultivate ecocentric thinking in their students, what would you tell them? What do they need to understand first? Probes:

- What preparation or learning would they need to do?
- What mistakes should they avoid?
- What relationships would they need to build?

3. What's the biggest misunderstanding you see when educators try to "integrate" eco-centric or nature-based perspectives without proper grounding?

Feedback on Research Direction

Context to share: I've been exploring themes that keep appearing in eco-centric pedagogies - things like learning from place, recognising more-than-human beings as active participants, embodied and sensory learning, and thinking in cycles and reciprocity. I'm wondering if these could offer insights for service design education. I'd value your feedback.

1. Do these themes resonate with your understanding and experience? What am I missing or not seeing properly? *Probes:*

- Which feels most foundational?
- Are there risks in how I'm framing these?

2. Is there anything I haven't asked about that you think is important for me to understand? Or anything you'd like to share that we haven't covered?

Appendix 2. Interview questions for Service Design Educators

Current Teaching practice

1. Can you tell me about the service design course(s) you teach and what are the main learning objectives? How much freedom do you have to shape curriculum? Do you follow a pre-set guideline?
2. How do you currently approach teaching about sustainability or environmental considerations in service design? Is it taught as a dedicated topic, integrated across courses, or something else? What frameworks or concepts do you use? (circular economy, SDGs, life cycle assessment, etc.)
3. Can you give me an example of how this shows up in a student project or assignment? Are students engaged with this topic?
4. When you teach students to identify stakeholders or map service ecosystems, who or what typically gets included? How do you define "ecosystem" in service design?
5. Do you teach students to consider other entities in the living ecosystem - like plants, animals, waterways, soil - when designing services?

Challenges and Gaps

1. What are the biggest barriers or challenges you face in teaching about ecological or environmental dimensions of service design? Is it time? Curriculum constraints? Your own knowledge? Student resistance? Institutional pressures? Project partners?
2. What do you see as missing in current service design education when it comes to ecological or eco-centric thinking?
3. If you had a magic wand and could change ONE thing about how service design is taught to better address ecological realities, what would you change?

Eco-centric Perspective and Future Directions

1. Have you engaged with eco-centric approaches - such as nature-based learning, place-based education, multispecies design- in your service design teaching?
2. I'm exploring how eco-centric pedagogies - including, place-based, nature-based learning, and relational approaches - might offer insights for service design education. What would make a framework or set of guiding principles actually useful to you in your teaching? Probes:

- Specific methods? Case studies? Assessment criteria? Reading lists?
- What format would work - detailed guide, one-page checklist, example syllabi?

3. What role do you think service design education should play in addressing climate and ecological crises? Probes:

- Where do you think the field needs to go?
- What gives you hope? What worries you?

4. Is there anything I didn't ask about that you think is important for me to understand about teaching service design in relation to ecology, sustainability, or eco-centric perspectives?