Original Paper

Ecoliteracy and ecopedagogy for environmental sustainability in education

In support of ecocentric, arts-based business education

Helen Kopnina, Kate Black, Helen Tracey

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Abstract. *The planet faces a global ecological crisis of climate change, biodiversity loss and species extinction. Conventional management approaches are failing to address this crisis. There is an urgent need to adopt an ecology-centred (ecocentric) ethic to support business education. We interweave positive and critical perspectives to question the pervasive neoliberal logic dominating business education and practice. We argue that*

the education for sustainable development goals embraced by management education, offered as the *framework for addressing environmental concerns, fails to recognise the limits to industrial growth and remains anthropocentric and bound by economic logic. Instead, we propose arts-based ecopedagogy as a radical challenge to business education enabling reorientation towards the praxis necessary to support transformation in learner consciousness and thus influence a future management practice. We provide practice examples that draw upon arts-based education, ecopedagogy and ecoliteracy focusing on biodiversity. We propose future directions that integrate ecological and human well-being within management curricula.*

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1. Introduction: Biodiversity crises and business education

The world is in a period of crisis. This crisis comprises not only the state of "permanent economic emergency" (Zizek, 2010), widening poverty, class, and gender inequality, but a crisis of climate change, biodiversity loss, and species extinction (Nilsen, 2023), which ultimately puts at risk all human systems and planetary boundaries maintaining functional biosphere integrity. Such a state prevails despite the United Nations (UN) Sustainable Development Goals (SDGs), designed two decades ago, to address such concerns. The seventeen SDGs emphasise economic and social aspects of sustainability (e.g., Crane et al., 2008), focusing on the key priorities of poverty, health, education, and inequality while addressing environmental issues in strictly instrumental terms (Westermann et al., 2020). That the planetary crisis prevails is attributable, at least in part, to the tension between SDGs' aims to improve planetary and human welfare and their commitment to economic growth (Adelman**,** 2018; Bonnett, 2007; 2023; 2024) and anthropocentric or utilitarian approach to sustainability (e.g., Adelman, 2018; Kopnina, 2020, 2021; Visseren-Hamakers, 2020). The extent of the ecological crisis within this wider planetary crisis, has been recognised through the adoption of the Kunming-Montreal Global Biodiversity Framework (GBF) developed during the UN Convention on Biological Diversity in December 2022, and revisited during the recent COP16 summit in November 2024 (CBD, 2024). This Framework has formulated an international agreement to protect 30% of ecosystems by 2030 (CBD, 2024; UNEP, n.d.). To achieve this

ambition, GBF's Target 15 prescribes that businesses assess and disclose their environmental risks, impacts and dependencies through their operations, supply and value chains, and portfolios (ARUP, n.d.). Yet, while a positive step, necessitating scrutiny of commercial companies' operations (MSCI, 2023), this recent endeavour still fails to address the root causes of ecological degradation and mass extinctions, particularly land conversion for agriculture and industrial development (Dirzo et al., 2022).

According to a joinmt investigation with Carbon Brief (2024) (https://www.cbd.int/conferences/2024), more than 85% of countries reportedly missed the UN's deadline to submit new nature pledges ahead of the Conference of Parties (COP16) at the biodiversity summit held in Colombia between October 21 and November 1, 2024. Only five of the seventeen highly biodiverse countries, that together comprise 70% of the world's biodiversity, have produced new pledges for tackling nature loss (Carbon Brief, 2024). Central in discussions at COP16 was the need for corporate leaders as well as members of civil society, to re-orient themselves towards a new paradigm position, away from the capitalist and anthropocentric narrative of sustainability towards a new ecocentric narrative through education (https://www.cisl.cam.ac.uk/cop16-briefing). As one of the authors of this article is a contributor to The International Union for Conservation of Nature's IUCN Commission on Education and Communication (CEC) and *Guide to Nature-based Leadership: An Ecological Approach,* the need to increase awareness of biodiversity in education is keenly felt. Business and Management Schools (hereafter Business Schools) are positioned centrally in this paradigm shift. The potential impact of Business School education is significant given their links to local businesses and social concerns, as well as having large student numbers. However, the persistent paradigm within these Schools remains focused on capitalist principles and the preservation of the status quo (Gardner et al., 2021). This paper will discuss how Business Schools might though play a significant role in the necessary paradigm shift by adopting learning activities based on ecoliteracy and ecopedagogy. Reorientating our education could, we argue, underscore the increasingly essential role of Business Schools in fostering biodiversity-focused education. By positioning business education as a hub for ecological literacy and ecopedagogy, Business Schools should integrate not only learning about, but also *for*, biodiversity across diverse learning contexts beyond the current education focused on sustainable development informed by Education for Sustainable Development Goals (ESDG).

Education for Sustainable Development Goals (ESDG) still lacks the "technical and scientific expertise" to understand and respond to the "tensions between biodiversity and carbon reduction" (Baudoin et al., 2023, p. 756). This gap concerns the full range of environmental ethics from a management perspective (Starik, 1995; Cunha et al., 2008; Borland & Lindgreen, 2013; Nicolaides, 2017; Allen et al., 2019; Phillips & Reichart, 2000; Sayers et al., 2021; Kortetmäki et al., 2023). That Business Schools have not engaged effectively with concerns of sustainability and biodiversity loss, il illustrated in that from 2000 to 2019 in the journals produced by the Academy of Management, "there are zero articles on species decline and biodiversity". Moreover, of the 50 journals used in the *Financial Times* Research ranking of Business Schools have published only 11 (out of a total of 47,000) such articles have been published (Goodall & Oswald, 2019). The continued lack of discussion of, or engagement with, biodiversity in management journals is apparent after systematic keyword searches ('biodiversity', 'extinction', 'ecosystem').

Few matches for the business, biodiversity, and education nexus could result from selection bias: biodiversity has been a niche topic in business education. Highly rated management and business education journals feature articles that equate sustainability with sustainable development and ESD. Yet, the urgency of addressing environmental problems within business education is increasing, with calls for developing pedagogical approaches to represent non-human stakeholders (Tallberg et al., 2022) and for insights offered by such novel pedagogies as ecopedagogy (Dallyn et al., 2024), and other forms of business education. In contrast to anthropocentric approaches, ecocentrism recognises the intrinsic value of nature (Rolston, 1985) - an element missing in business education.

If we are to counter the pervasive anthropocentrism that puts "human needs and wants… above the survival and development needs of other species" (Borland & Lindgreen, 2013:173), and acknowledge nonhuman stakeholders (Starik, 1995; Allen et al., 2019; Phillips & Reichart, 2000; Kortetmäki et al., 2023), we need to challenge the dominant SDGs (Bonnett, 2007; 2023; 2024; Kopnina, 2012; 2020; 2021; Adelman, 2018; Visseren-Hamakers, 2020) to support the necessary shift in (business) education. In preparing future managers for effective practice, we argue that business education should broaden its scope to ensure that biodiversity and extinction-related investments are foregrounded.

We aim to achieve this by building on a wider range of content and pedagogical approaches in education for sustainability (EfS) within management learning. Accordingly, we assert the importance of replacing the dominant

anthropocentric business education underpinned by ESDG (Torpman & Röcklinsberg, 2021; Moratis & Melissen, 2022) with arts-based business education (Cunha et al., 2008) grounded in ecopedagogy (Kahn, 2010) and ecocentric learning (Bonnett, 2023; 2024). In doing so, we acknowledge the challenges of such radical proposals (e.g., Purser, Park & Mountouri, 1995).

Ecopedagogy (Kahn, 2010), which connects the distinct fields of ecology and pedagogy, is an educational approach based on an ecological worldview, encompassing distinctive values of philosophy, ethics, culture, and society (Hung, 2021). In business education, this connection is akin to the term Paul Shrivastava (1995) has coined, that of an ecocentric management paradigm, which integrates a holistic view of the organization in balance with the environment. Philosophically, ecopedagogy focuses on the metaphysical investigation of the human-nature relationship through education, while also acknowledging *ecojustice* including criticism of human supremacism (Baxter, 2005). Ecopedagogy questions the oppressive structures and power systems, employing ecoliteracy (Orr, 1990).

Below, we discuss how an arts-based education can disrupt the tenets of neoliberal capitalist ideology by emphasising the political, critical, and transformative aspects of ecopedagogy. Arts-based teaching is still relatively new in business and management education and provides opportunities for learners to construct meaning through sensemaking (Flamand, Perret & Picq, 2022). In conjunction with an arts-based ecopedagogy, these approaches can challenge the status quo represented by the ESDG.

In what follows, we first evaluate the shortcomings of the prevailing ESDG approach to environmental sustainability through education. We then develop a framework for navigating the radical arts-based strategies that can be employed in business education to recognise non-human stakeholders and address biodiversity loss. This research is aimed at management learners and educators willing to make more deliberate choices about their practice.

2. Methodology

This study employs an interpretive content analysis approach (Ahuvia, 2001), following the methods outlined by Milne and Adler (1999) in the context of environmental disclosures, to examine the occurrence of three main pedagogical approaches – ecopedagogy, eco-literacy and arts-based learning within Business School curricula and within the business education academic literature.

Interpretive content analysis of the business education literature an approach used in studies related to biodiversity and business, for example, biodiversity accounting studies (e.g., Zhao & Atkins, 2021), corporate social responsibility (CSR) managers and biodiversity (Bedarkar et al., 2024), facilitates the identification of patterns and commonalities across organisations and over time (Laine, 2010).

To summarise the key strategies for learning about biodiversity, three researchers independently overviewed the literature on biodiversity, business, and education. Once the reading review was complete, several rounds of closer reading of the texts were carried out, and significant extracts were identified from the literature to form themes. The themes identified from the analysis were classified into several general categories, summarising the educational initiatives for biodiversity conservation within business education.

Our interpretive content analysis, we employed a list of keywords to identify these themes to evaluate the current state of biodiversity learning in Business Schools. Accordingly, we searched literature employing such terms as:

> biodiversity, conservation, preservation, protection, restoration, sustainable use, development, ecosystem, environment, ecology, ecological, environment, species, habitat, wetland, mangrove, forest, marine, coastal area, shrubland, grassland, protected area, park, garden, urban green space, lawn, beach, river, lake, stream, nature reserve, ecological restoration, and ecosystem service.

In our interpretive analysis of educational approaches and strategies, we generated descriptive codes for themes based on these terms. These preliminary codes were then iteratively refined through constant comparison and consolidation of similar codes, adhering to the principles of grounded theory applied in sustainability studies and environmental reporting (Beck et al., 2010; Hahn et al., 2023). By integrating similar codes, the researchers continuously compared new codes with existing codes and categories to determine whether they fit into the existing category structure or whether new categories needed to be created (Gioia, 2021). The themes identified from the analysis were classified to explain the current status of biodiversity within business education. For biodiversity, these categories include, for example, terrestrial and marine species conservation, protection of wetlands and surrounding ecosystems, wildlife and habitat conservation, urban biodiversity, public awareness of biodiversity,

biodiversity assessment, collaboration with stakeholders and local biodiversity custodians, and financial support allocated to biodiversity conservation.

Using these terms, we have searched business school programs (curricula and associated literature) in UK universities to ascertain how business curricula used terms in program names, syllabi, or other descriptions available online concerning biodiversity.

3. Education for Sustainable Development Goals (ESDG)

The literature search indicated that biodiversity and related terms were almost exclusively used in Business Schools concerning SDGs, especially numbers 14 and 15, life on land and under water. ESDG, a UNESCO-led initiative, is perhaps the most influential in supporting management learners across all educational levels to develop the knowledge, skills, and values encompassed in seventeen interconnected SDGs (UNESCO, 2017).

The implementation of SDGs across the business and management education landscape is tracked by a UN initiative the Principles for Responsible Management Education or PRME (n.d.), whose mission is to "transform management education and develop the responsible decision-makers of tomorrow to advance sustainable development. However, ESDGs as instigated by PRME, while propelling a "heightened focus on responsibility in curricula" (Wall et al., 2023:293) across Business Schools may be insufficient to address the current global crisis in biodiversity. As Huckle and Wals (2015) assert, "the majority of those … educational projects and programs [developed] under its [the ESDG] umbrella have failed, through … misplaced idealism, or the censoring of more critical ideas and content, to face up to current global realities" (p.492).

Our literature and curricula review provide evidence that much of the inability of business education to address the current grand global challenges lies in the fundamental limitations of the SDGs themselves. Responsibility to the environment is perceived in terms of distributing environmental risks, such as climate change and pollution, among human groups (Borland & Lindgreen, 2013). Economic growth is explicit in SDG8, and even SDGs 14 and 15, focused on life underwater and life on land, treat biodiversity as a resource and ecosystems as a service. In the policy documents SDGs 1 and 2, on poverty and hunger, are dependent on economic growth, without considering biodiversity costs. Thus, business education, even the critical literature reflecting the ESDGs,

remains ultimately focused on growth, still ill-preparing managers to address these global threats despite espousing sustainability and environmental credentials within a PRME guiding framework. The introduction of market devices such as tuition fees, rankings, accreditations, and the focus on employability has positioned Business-Management Schools as "battery farm[s] growing graduates" (Cowden & Singh, 2013, 4; see also Mason et al., 2024). Moreover, evaluations of universities against the SDGs across the areas of teaching, research, stewardship, and engagement in The Times Higher Education Impact Rankings[1] are based upon self-evaluation and thus the robustness of the data might well be questioned. Submission of UK business education to this financial logic has resulted in a focus on the transactional acquisition of knowledge that is perceived to benefit individuals. Business education has therefore become an individualised instrumental experience, and levels of knowledge have become impoverished, merely consumed rather than extended. Such education does little to address the multi-faceted global crises facing us. That this is the case is further compounded by business education remaining largely "disconnected" from the necessary interdisciplinary discussions and know-how to "adequately prepare future managers and decision-makers to solve grand challenges" (Baudoin et al., 2023, p. 754).

Consequentially, the ideal held by sustainability advocates of "equity, justice and the right to life" (Alexander et al., 2022, p.976) is reserved for one species – man (*sic*). Ironically, progress in social and economic areas resulted in increased population and production, adversely impacting the environment (Slater & Hannaford, 2024). Persisting with such anthropocentrism within a key business education framework risks further degradation of our natural world. Addressing the global crises necessitates a transformational shift in the very tenets business education in the pedagogies employed. As previous studies have shown, even the more critical business education and wider business-management literature remains dominated by anthropocentrism, ignoring the nonhuman world, and perpetuating ecological injustice (Baxter, 2005), with CSR practices woefully disconnected from biodiversity (Bedarkar et al 2024). Critical scholars have noted that conventional pedagogies in business schools are oblivious to the planetary crises and are unable to address the wicked and interconnected global sustainability challenges precisely because they remain embedded in conventional paradigms (e.g., Painter-Morland et al., 2017; Adelman, 2018; Kopnina, 2020; Visseren-Hamakers, 2020; Bedarkar et al 2024).

[1] https://www.timeshighereducation.com/impactrankings

Indeed, while education *for* biodiversity is encouraged (UNESCO, 2022), little reflection is given on *how* to address and arrest environmental decline and biodiversity loss (Greenfield, 2020). We assert the need for business education to employ novel and critical pedagogies that engage learners' emotions (Skilling et al., 2023) through ecopedagogy and ecoliteracy while concurrently, and explicitly, focussing on the current crises. We propose that arts-based learning can address these challenges.

4. Non-human stakeholders in business education

The mainstream growth paradigm needs rethinking. The need for a radical alternative is reflected in the lack of progress towards addressing ecological crises despite an increasing range of research and practice cited in business and management-focused journals, such as *Corporate Social Responsibility and Environmental Management* (e.g., Cunha et al., 2008), *Organization* (e.g., Sage et al., 2016) *Leadership* (e.g., Fotaki & Foroughi, 2022), *Journal of Environmental Management* (e.g., Kopnina et al., 2024a).

These have included the ecocentric organisation paradigm (Purser et al., 1995), ecocentric management (Cunha et al., 2008), ecocentric business (Borland & Lindgreen, 2013; Nicolaides, 2017), animal activism (Tallberg et al., 2022), sustainability leadership (Heizmann & Liu, 2018), and posthuman affirmative business ethics (Sayers et al., 2021). The plea to include nonhuman stakeholders has been made in leading environmental education journals such as *Environmental Education Research* (e.g., Kopnina, 2012; Huckle & Wals, 2015; Russell & Spannring, 2019), *The Journal of Environmental Education* (e.g., Kopnina, 2016; 2020; Warlenius, 2022; Pliushchik et al., 2024), and *Canadian Journal of Environmental Education* (e.g., Oakley et al., 2010).

Management Learning has started to address th**e** need for new, more critical, pedagogical approaches in a 2022 Special Issue (SI) edited by Lavine et al. (2022). This SI proposed meshing positive organisational scholarship and critical management perspectives to question the pervasive managerial and economic logics that dominate business education and practice. It proposed a need for ethics-first, contrarian approaches to engender systemic activism through themes for future directions including the need for a "contrarian" approach to business education and "ethics-first focus" upon both ecological and human well-being to bring about necessary "systemic activism" that recognises the multifaceted and interconnected nature of this global crisis (Lavine et al., 2022). However, this SI did not explicitly consider the biodiversity crisis nor place much emphasis on

non-human stakeholders. If we are to counter anthropocentrism, we need to include non-human stakeholders. While publications in *Management Learning* increasingly focus on arts-based teaching, this didactic methodology is used to support and not question ESDG (Flamand, Perret & Picq, 2022; Moratis & Melissen, 2022). To address this, we outline three dimensions of an arts-based ecopedagogy; political, critical and transformative.

5. A political arts-based ecopedagogy

As we have proposed, the dominant management paradigm based on neoclassical economics (Herbrechter, 2023) has failed to address the global grand challenges of species extinction and environmental degradation. There is a need to reorientate business education away from capitalist logic, individualism, and performance-profit above all else (Holmes, 2023). Instead, business education should reconnect us with nature, recognising the inextricable intertwining of man (*sic*) and planet (Heizmann & Liu, 2018; Holmes, 2023; Hansen et al., 2015). To enable this, scholars have cited the need for business education to become more political (Purser et al., 1995; Ergene, Banerjee & Hoffman, 2020). Ecopedagogy recognises the politics that underlie business education and pedagogy (Dallyn et al., 2024; Shannon, 1992). It originates in the recognition that if we are to avoid further environmental and biosystem decline we need to "reconsider the ecological and systemic foundations for sustainability, and to integrate our work more closely with the natural sciences" (Whiteman et al., 2013, p. 307). Ecopedagogy is thus underpinned by principles and values of ecological integrity, recognising the "limits to growth" (Meadows et al., 1972), and promoting well-being for *all* species within the limits of planetary boundaries (Rockström et al., 2010; Whiteman et al., 2013) and planetary thresholds (Nilsen, 2023).

Several diverse ecopedagogical approaches have emerged since The Belgrade Charter on environmental education (UNESCO & UNEP, 1975) that share the ambition to identify the root causes of environmental problems to find workable, constructive solutions (Misiaszek, 2020). However, while ecopedagogy is embedded within some UK business-management curricula, it is mostly employed to address social and economic costs of climate change (for example, at the University of Glasgow[2]), rather than addressing biodiversity loss. Indeed, the business discipline and education still lack the recognition of biodiversity loss as a pivotal environmental issue (Winn & Pogutz, 2013; Kopnina et al., 2024b).

[2] https://www.gla.ac.uk/research/az/sustainablesolutions/courses/ecopedagogyforbeginnersputtingclimatechangeeducationintoaction/

As learners require critical thinking skills to challenge the SDG assumptions, we propose that learners can develop their understanding of biodiversity as part of responsible and ethical business leadership by engaging in arts-based ecopedagogy. In our education practice, the first stage in developing these skills is through ecoliteracy. Ground-breaking publications such as *Should Trees Have Standing* by Christopher Stone (1973), and, building on that, Mark Starik's (1995) *Should trees have managerial standing?* introduce learners to a perspective that is radically different from SDGs.

Reflecting on radical environmentalist films, enacting non-human stakeholders through in-class role plays, and organising class debates about complex topics like decoupling of the economy from natural resources, are other ways to engage learners in questioning the capitalist view of nature as a resource (Kopnina, 2020; Kopnina & Bedford, 2024). In teaching children, however, more comprehensive techniques and concepts can be used. Traditionally engagement with films in class would involve non-fictional documentary films to bring some points regarding biodiversity across. However, utilising a range of fiction as a form of ecopedagogy is well established in children's literature (e.g., Hawley, 2017; Rato, 2024), with a growing application in higher education (e.g., Shoaib, Mubarak & Khan, 2020). This reflects the need for ecopedagogical learning to be continuous and made relevant to concepts studied at each educational level. Through arts-based methods, higher education students can be encouraged to produce their own fiction, such as producing their own children's book that explains the concepts they have learned to a younger audience. This is an extension of our teaching practice in which students welcomed the opportunity to explain the environmental concepts they had learned to children. Through this exercise, students questioned the foundations of their knowledge given that children would not understand the business concepts they typically took for granted.

Another option is for learners to extrapolate their knowledge into a dystopian fictional narrative, play or zine. Zine production is a creative critical pedagogy that has been used in environment-related fields (e.g., Velasco, Faria & Walenta, 2020) and could be adapted to ecopedagogy. With a basis in ecoliteracy, learners can also be encouraged to be more creative in their choice of sources, such as Buckland's (2016) analysis of environmental ethical statements in thrash metal songs to challenge anthropocentrism. In experiential learning, children (and older students) may also be involved in outdoor activities, actively interacting with nature, rather than passively learning from it (Sitka-Sage et al., 2017). Thus, children and learners are encouraged through creative media to extend their current understanding of biodiversity crises.

6. A critical arts-based ecopedagogy

Significantly, ecopedagogy is based upon the Freirean principle of situating learning activities in the life experiences and concerns of learners and educators, shared through dialogue (Freire, 1970; 1973). The "dialectic between reflection and action" results in a "radical rejection of one reality, and action proclaiming a new reality to take its place" (Kuhn, 2004, p.9), ultimately resulting in "transformative action" (Giroux, 1991, p.47). Antunes and Gadotti (2005) discuss several examples of ecopedagogy from the Earth Charter and emphasise the need to educate learners to think about the Earth's identity as essential to the human condition; shape the planetary conscience; and educate for care. As such, ecopedagogy is well-placed to shift business eductaion to social learning related to business and biodiversity (Smith et al., 2020). This encourages a more reflexive and critical approach (Kahn, 2010) and thus has the potential to address the shortcomings of the conventional ESDG. The ecopedagogy approach is especially pertinent for business education because it transcends economy-centred prescriptions raising learners' critical consciousness (McCarthy & Grosser, 2023) to more radical transformative thinking beyond the boundaries of the "sustainable development" rhetoric put forward by the PRME principles. This thinking can enable the move away from sustainability-related outputs that businesses are quite good at delivering, and a move toward sustainability-related outcomes and ultimately impacts (Hahn et al., 2023).

This may be achieved, for example, by using in-class debates and role-plays (Gómez-Poyato et al., 2020; Kopnina, 2020, 2021; Kopnina & Saari, 2021) that challenge learners to embody positions radically different to those inherent in capitalist logic. In our education practice, students participate in the Shell role-play game (Kopnina & Bedford, 2024). This game invites them to decide whether to drill in the Arctic or diversify into renewable energy. The learners adopt various roles, within the executive board, and shareholders, but also involving non-human stakeholders, such as polar bears. In a separate activity, learners critique the SDGs from the perspective of a blue macaw (from the Disney Pixar film *Rio*). Dydynski and Mäekivi (2021) discussed how cartoon animals create expectations for their interactions with humans. Through this exercise, students realise that the first and second SDGs, relieving hunger and poverty, may require the expansion of productive land, with detrimental effects on these birds' habitats, as is evidenced by their endangered status in the Amazon.

Another critical thinking exercise for leraners involves creative physical conceptual maps and applying systems theory to the SDGs (Malcolm, & Skene,

2020). Learners not only link SDGs to a selected company, but to map out potential trade-offs of economic development. For example, if a company focuses on SDG 8, economic growth, how does this reflect on SDG 13, climate change? Such approaches utilise fiction and cultural resources and can provide space for critical thinking about controversial subjects such as corporate investment in family planning, targeting unwanted pregnancies and women's rights as part of the CSR strategy (Nuwasiima et al., 2017). Learners can also consider inequality between species and differences in consumption patterns in different parts of the world or across society (Zulfiquar & Prasad, 2021). The explicit engagement with SDGs and discussions of potential adverse impacts of business activities on biodiversity cultivate a deep-seated consciousness of the extinction crisis. This highlights the learners' roles as future business professionals in disrupting the "business-as-usual" trajectory by considering, for example, degrowth and dematerialisation models that include manufacturing to service shift (e.g., Fix, 2019). In the current economic system, Khmara & Kronenberg, (2018:727) reflect that strategies such as premium pricing may reduce the accessibility of products and thus "degrowth requires new incentives and disincentives to change the behaviours of both producers and consumers". There is an urgent need to study transition pathways to a sustainable degrowth system, but it needs to account for the microeconomic perspective of business management (Khmara & Kronenberg, 2018:727), and the types of thought and practice exercises that learners can participate in within teaching sessions. These exercises all support learners to see beyond the "one solution fits all approach" to CSR (Van Marrewijk, 2003, 96), through the process of socialisation that occurs through interaction at Business Schools that Wall et al. (2023, 293) referred to, "revealing the multiplicities of hidden curricula at play in a given learning environment", in this case, the "unofficial or implicit expectations, values, norms and messages conveyed" through SDGs.

7. A transformative arts-based ecopedagogy

Ecopedagogy can offer tools to operationalise degrowth (Kallis, 2011; Khmara & Kronenberg, 2018; Köves & Bajmócy, 2022), circular economy (Bauwens, 2021; Kopnina, 2021), and steady-state-economy (Daly & Townsend, 1993; Washington & Maloney, 2020). In business education, alternatives to the conventional linear (take, make, waste) production process could be spotlighted by corporate case studies that illustrate the production-to-services shift (Kopnina & Poldner, 2022). The main principles of circularity and the life cycle assessments support learners in influencing their organisations to make informed choices,

including the materials needed, manufacturing, delivery, use, and disposal of the by-products, such as packaging. Learners are also made aware that material products such as food and textiles cannot be infinitely reused (Kopnina & Poldner, 2022; Kopnina et al., 2022), and that 'circularity' is limited to preindustrial or innovative designs that can only partially close the loop.

Early educational exposure to ecoliteracy could involve immersive activities, like nature-based learning, hands-on projects, and simulations of ecological systems. As learners advance, this could evolve into case studies, critical discussions, and project-based learning focused on real-world biodiversity challenges, particularly those impacted by business. Integrating these activities from primary school into higher education could nurture eco-conscious perspectives, equipping future leaders with an ingrained appreciation for sustainability and skills to address ecological challenges in the business world.

Significantly, arts-based ecopedagogy as business education should focus on decision-making and action in the present, not at a suitable future time. This is a radical challenge to capitalism's temporal focus on the future that is reproduced through conventional business education. Radical approaches to ecopedagogy will engage learners in physical projects of upcycling. For example, Delacroix's (2023) rug weaving from recycled clothes could be used to prompt a more critical discussion of SDGs. Such activities are pertinent as upcycling has been demonstrated to impact learners' attitudes towards the environment (Flowers, Rauch & Wierzbicki, 2018).

Outside of art-based pedagogies, and well-placed to be combined with them, are some activity ideas for each educational level, tailored to foster ecoliteracy and ecopedagogy include:

Primary School

1. **Nature Walks, Interaction and Keeping Journals**: Students participate in guided nature walks and document observations in journals, focusing on local flora and fauna. This helps build early awareness of biodiversity and ecosystems.
2. **Mini Ecosystem Projects**: Children create simple terrariums or small habitats, observing and learning about plant and animal interdependence.

3. **Storytelling and Art**: Reading nature-focused stories, followed by drawing or creating clay models, lets students express their understanding of biodiversity creatively.

Middle School

1. **Local Ecosystem Mapping**: Students map out the biodiversity in their local area, identifying species, plants, and habitats, and discuss human impacts.
2. **Biodiversity Poster Campaigns**: Creating posters on endangered species or ecosystems encourages students to research and communicate conservation messages.
3. **Eco-Club Initiatives**: Forming an eco-club where students participate in clean-up drives, plant trees, or engage in recycling projects instils a sense of responsibility and action.

High School

1. **Environmental Debate and Case Studies**: Engage students in debates on topics like deforestation, climate change, and biodiversity loss, using case studies to understand complex issues.
2. **Biodiversity Audit**: Conduct an audit of the school's grounds to document species, biodiversity, and waste, followed by discussions on improving ecological practices.
3. **Field Research Projects**: Students collaborate with local conservation groups or national parks to conduct field research, experiencing biodiversity work firsthand.

University and Business School

1. **Corporate Impact Analysis**: Students examine case studies of companies in extractive industries and analyse how their practices affect biodiversity, proposing ecologically sound alternatives.
2. **Sustainability Simulations and Role-Playing**: Using simulations where students take on roles (such as CEO, environmentalist, policymaker) fosters a balanced view on sustainability and business.
3. **Collaborative Projects with NGOs or Local Communities**: Encouraging partnerships to work on real-world biodiversity conservation projects integrates theory with practice and community impact.

Broader arts-based projects could include learner-designs for businesses and communities that support degrowth, engaging students in photographing established degrowth businesses (Pacholok, 2023) and promoting learner involvement in existing social projects and businesses through the curriculum. These projects should encourage learners to take a hands-on approach and get back in touch with nature and the community to engender a deeper understanding of the adverse impacts of capitalism. Building on their experience, learners would then create multi-media depictions of a future utopia and design interventions that could support the achievement of their vision.

8. Conclusions

While the existing literature is not inconsiderable in extent, its focus has been on defining ecopedagogy conceptually through thought pieces or commentaries. Few articles operationalise arts-based ecopedagogy in practice in higher education. While arts-based ecopedagogy is not without its limitations in addressing the urgent global challenges, and certainly within the context of the dominant capitalist-financial logic, it offers practical solutions that can be embedded effectively within business education to address issues of sustainability and biodiversity loss.

Conventional approaches to business education focus on individual knowledge and skill development based largely on contribution to a capitalist profit-focused growth model. Thus, despite the rhetoric of sustainability and responsibility, business education is bound by the economic-growth-driven logic. The ecological impact of these approaches is conventionally examined through the UN SDG and associated ESDG. We have acknowledged the tensions in operationalising the SDGs, recognising their significant limitations, in that learners are not encouraged to think beyond an anthropocentric world and are rarely empowered to think critically about the impacts of their leadership and practices beyond organisational, and certainly human-world boundaries.

Instead, we have proposed arts-based ecopedagogy, grounded in ecopedagogy and political, critical, and transformational learning to address the current biodiversity crisis. Failure to address this crisis places significant human and societal risks. Engaging with arts-based ecopedagogy in a flipped learning environment allows learners to adopt different positions to those of the capitalist logic supporting learners to question the status quo through taking non-human perspectives on issues, allowing us to "disrupt unjust and unsustainable divides that other us from one another and the rest of Nature" (Misiaszek et al. 2022, p.

620). In the spirit of Freire (1970, 1973), we assert that there is a need to support learners to develop not only 'critical consciousness' but also to work actively, and collectively to transform reality to see and understand the potential for collective impact that could lead to real change in future management practice where the environment is front and foremost.

However, we recognise that de-centring dominant ways of knowing and being can have the opposite effect than intended. For critical pedagogies to be effective, pedagogical spaces need to be understood by business education and educators, not places in which knowledge is gifted to others who lack this for them to bank it (Freire, 1970), but as safe spaces in which multiple pieces of knowledge can be shared. A resultant collective co-construction and co-creation of new knowledge will transform management thinking and being. This necessitates a significantly changed understanding of, and approach to, learning and indeed away from what is typically measured and accredited.

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Authors

Helen Kopnina (*corresponding author*)
helen.kopnina@northumbria.ac.uk
Newcastle Business School, Northumbria University, Newcastle upon Tyne, UK.
ORCID https://orcid.org/0000-0001-7617-2288 Scopus Author ID 11541014500

Kate Black
kate.black@northumbria.ac.uk
Newcastle Business School, Northumbria University, Newcastle upon Tyne, UK
ORCID https://orcid.org/0000-0003-0931-501X Scopus Author ID: 56720091400

Helen Tracey
helen.tracey@northumbria.ac.uk
Newcastle Business School, Northumbria University, Newcastle upon Tyne, UK
ORCID https://orcid.org/0000-0003-4104-562X

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