SOCIETY REGISTER

Original Article

Ecological crises in higher education: making biodiversity matter for business students through critical thinking and interdisciplinary approaches

SOCIETY REGISTER
2025 / 9(2): 7–34
ISSN: 2544–5502
DOI: 10.14746/sr.2025.9.2.01

OPEN ACCESS

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ABSTRACT: Biodiversity loss is accelerating at an alarming rate, posing significant challenges for sustainability, yet it remains inadequately addressed in business management education. Current sustainability pedagogies in business schools are predominantly anthropocentric, overlooking the biodiversity and extinction crises. This study examines the limitations of these approaches, particularly their failure to incorporate ecocentric perspectives and interdisciplinary methods critical for a comprehensive understanding of biodiversity. To address this gap, this paper integrates intra-, inter-, and transdisciplinary perspectives, offering a framework that challenges traditional, siloed approaches to business education. This research aims to bridge the gap between business education and biodiversity. We use secondary-data-based case studies of organizations and institutions of higher learning that offer business/corporate or executive education. This paper demonstrates how an ecocentric curriculum can more comprehensively address biodiversity challenges in sustainability education by examining case studies and incorporating insights from fields including psychology, natural sciences, and social sciences. Key findings indicate that traditional business curricula lack the depth needed to tackle complex ecological issues, and integrating interdisciplinary approaches enhances students' understanding of biodiversity's role in sustainability. We conclude that reimagining Education for Sustainable Development (ESD) within business schools through an ecocentric framework is essential. This shift transcends disciplinary boundaries and fosters ethical leadership capable of addressing the complexities of biodiversity loss, contributing to more holistic sustainability education.

KEYWORDS: biodiversity, business education, corporate social responsibility, degrowth,

ecocentrism, ecoliteracy, ecopedagogy, environmental ethics, sustainability

INTRODUCTION: INTEGRATING BIODIVERSITY IN BUSINESS EDUCATION

The accelerating biodiversity crisis, driven by human activities such as agricultural expansion, population growth, and social inequities, underscores the urgency for education to address these challenges comprehensively (IPBES, 2019; IUCN, 2022). Livestock farming alone contributes 15% of global greenhouse gas emissions and plays a significant role in species extinction (Hur et al., 2024; Morton, 2022). Extractive industries further exacerbate these impacts, making it imperative for business education to engage with biodiversity issues meaningfully (Panwar et al., 2023). Despite this urgency, biodiversity remains underrepresented in business school curricula, limiting students' understanding of ecological interdependencies critical for effective leadership in sustainability (Norat et al., 2016).

The need for holistic approaches to address grand societal challenges has been emphasized in recent research, which calls for linking business and societal issues through interdisciplinary frameworks (Kunisch et al., 2023; Brown et al., 2022). We distinguish between intra-, inter-, and transdisciplinary perspectives to clarify our framework. Intradisciplinary approaches remain within the boundaries of a single discipline, such as business ethics or management studies, applying their tools to sustainability topics. Interdisciplinary approaches involve integrating methods and perspectives from multiple academic disciplines, such as combining ecological science with psychology or sociology, to address complex challenges like biodiversity loss. Transdisciplinary perspectives go beyond academia, engaging non-academic stakeholders such as NGOs or corporations in co-creating knowledge and solutions. These distinctions are crucial for understanding how biodiversity education can transcend siloed thinking (Gruner & Minunno, 2023; Nielsen et al., 2021) and support systemic, practice-oriented learning (Alegre et al., 2023).

To counter this, ecoliteracy offers a promising avenue for cultivating a systems-level understanding of ecological interdependencies. By incorporating critical thinking and problem-solving into sustainability education, ecoliteracy enables students to engage with the complex challenges posed by biodiversity loss (McBride et al., 2013; Orr, 2024; Stibbe & Luna, 2009). Drawing from psychology, sociology, natural sciences, and economics, such interdisciplinary approaches deepen understanding and application of sustainability principles (Schlütter et al., 2023).

Equally important is the integration of transdisciplinary research, which bridges academic and non-academic stakeholders to address real-world challenges collaboratively (Beckmann & Schaltegger, 2020). For example, biodiversity accounting and manage-

ment require inputs from natural sciences to effectively address the underlying causes and impacts of biodiversity loss (Wohlgezogen et al., 2022; Kopnina et al., 2024). However, achieving true transdisciplinarity often encounters tensions between academic and non-academic actors, limiting its potential (Bansal & Sharma, 2022; Laasch et al., 2020).

This article reviews business and management curricula focusing on sustainability, corporate social responsibility (CSR), and environmental ethics, exploring interdisciplinary pedagogical strategies such as ecoliteracy and ecopedagogy to enrich biodiversity education. It addresses critical gaps in curricula, advocating for intra-, inter-, and transdisciplinary approaches to foster a more comprehensive understanding and integration of biodiversity into business education. The paper highlights how literature reviews and interdisciplinary syntheses can advance knowledge and inform curriculum development for sustainable business practices.

The paper also explores the application of critical pedagogy and ecopedagogy, analyzing their potential to challenge traditional anthropocentric approaches and promote ecocentric frameworks. By synthesizing these findings, we aim to provide actionable recommendations for curriculum development, advocating for a deeper integration of biodiversity concerns in business education. This aligns with the call for intra-, inter-, and transdisciplinary approaches, underscoring the importance of breaking down silos in sustainability research and education.

To enhance biodiversity education, we draw on foundational environmental education principles, such as those outlined in the Tbilisi Declaration (UNESCO, 1977), while advocating for ecocentric frameworks to counter prevailing anthropocentric approaches. The sections below detail the methodology employed and strategies for integrating ecocentrism or deep ecology, which recognizes the intrinsic value of nature (Naess, 1973), into business education.

METHODOLOGY

This study employed desk research and systematic content analysis of publicly available documents from selected university and corporate business education programs to examine how biodiversity is addressed using qualitative thematic synthesis. The study identifies current practices and gaps in biodiversity-focused education by drawing on academic literature and publicly available course syllabi, program descriptions, and pedagogical resources (Butt et al., 2014; Sánchez-Carracedo et al., 2021). Selection criteria targeted institutions and programs explicitly incorporating sustainability, biodiversity, or environmental management into their curricula, and only considered programs or courses advertised publicly and in English (see limitations section below). Searches for corporate education and training programs involved publicly available materials containing key terms such as "biodiversity," "ecosystems," "environmental restoration," "nature," "regeneration," and "rewilding." Our inclusion criteria required that each selected

case—whether a university or corporation—explicitly integrate biodiversity into business or executive education, as evidenced in publicly available documents (e.g., syllabi, training outlines, sustainability reports). Programs referencing sustainability without explicit biodiversity content were excluded to maintain thematic focus.

The methodology of this study was guided by a strategic approach to regional selection from diverse cultural, economic, and ecological contexts. The study initially set out to include regions that exemplify a range of policy-driven, grassroots, and institutional approaches to biodiversity education.

Beyond focusing on tertiary education institutions, the study also incorporated commercial enterprises such as Unilever, Patagonia, and HSBC. This reflects the growing intersection between academic and corporate learning, particularly in executive education. The increasing emphasis on sustainability training and lifelong learning further underscores the transdisciplinary nature of the study.

Within each selected region, institutions were evaluated based on specific criteria. These included a demonstrable or claimed commitment to environmental sustainability, evidenced through strategic plans and official programs, as well as the substantive integration of biodiversity into curricula through dedicated courses and programs that actively engage students or corporate participants. Additionally, the study considered institutions that adopted interdisciplinary approaches, incorporating insights from ecology, social sciences, and business studies. Another critical factor was the evidence of eco-pedagogical innovation, e.g., novel teaching methods to foster an ecocentric perspective. Finally, institutions were selected based on their emphasis on ecoliteracy development, ensuring that ecological literacy was embedded as a core learning outcome.

Among over 3,400 results meeting these criteria, we selected case studies from Unilever, Patagonia, and HSBC Bank, whose initiatives explicitly engage with biodiversity education. Higher education searches yielded over 7,800 results, from which seven universities were selected: the University of British Columbia, MIT Sloan School of Management, Judge Business School (University of Cambridge), Stockholm School of Economics, Harvard Business School, Newcastle Business School (Northumbria University), and Salford University's Business School. These institutions were chosen based on their explicit integration of biodiversity considerations within business and executive education (based on the publicly available documents found during the period specified in Methodology).

We applied qualitative thematic synthesis for analysis, coding each case around key themes such as ecoliteracy, interdisciplinarity, stakeholder inclusion, and curriculum integration. These were cross-compared to assess commonalities and distinctions, particularly in how they represent intra-, inter-, and transdisciplinary teaching strategies (Table 1).

Step	Corporate Education & Training	Higher Education Institutions
Desk Research & Analysis	Publicly available data on corporate programs	Academic literature, syllabi, program descriptions
Search Keywords	"Biodiversity," "Ecosystems," "Nature," "Rewilding," "Regeneration"	"Sustainability," "Biodiversity," "Environmental Management"
Total Results	3,400 matches	7,800 matches
Selection Criteria	Explicit engagement with biodiversity in training programs	Explicit integration of biodiversity in business curricula
Selected Case Studies / Institutions	Unilever (Biodiversity & sustainable sourcing) Patagonia (Regenerative business practices) HSBC Bank (Nature-based finance & biodiversity initiatives)	(CA) University of British Columbia (US) MIT Sloan School of Management (GB) Judge Business School (Cambridge) (SE) Stockholm School of Economics (US) Harvard Business School (GB) Newcastle Business School (Northumbria University) (GB) Salford University Business School

Table 1. Selection Process for Biodiversity Education in Business Schools and Corporate Training

Selected case studies highlight interdisciplinary approaches (Consorte-McCrea & Newing, 2015) to addressing socio-economic and environmental challenges. For example, Unilever's Sustainable Living Plan integrates biodiversity into corporate strategies, while Patagonia's initiatives focus on ecosystem restoration and environmental advocacy.

Among universities, Cambridge's Judge Business School incorporates biodiversity into its sustainability leadership programs, and Salford University emphasizes urban ecology and conservation in business contexts.

University of British Columbia (UBC) – IBioS Collaboratory

Rationale: UBC's focus on biodiversity through a collaborative model exemplifies how diverse academic disciplines can converge to tackle real-world issues. Integrating forestry, botany, and public policy showcases a comprehensive approach emphasizing research and stakeholder engagement, which is critical for preparing future business leaders to understand and act on biodiversity challenges.

MIT Sloan School of Management (MIT Sloan)

Rationale: By combining sustainable development with economic innovation, MIT Sloan offers insights into how businesses can innovate while mitigating biodiversity impacts. This case is particularly relevant for illustrating how economic frameworks can align with environmental goals, providing students with practical examples of balancing profitability and ecological responsibility.

University of Cambridge Judge Business School

Rationale: The exploration of political ecology and social justice reflects the

intersection of business, ecosystems, and equity issues. This case highlights the importance of understanding global inequalities and environmental policies, ensuring that future business leaders are equipped to engage with the social dimensions of sustainability alongside ecological concerns.

Stockholm School of Economics (SSE)

Rationale: SSE's incorporation of biodiversity into its curriculum emphasizes the role of ecosystem services and natural capital in corporate sustainability. This case demonstrates how businesses can leverage biodiversity as a strategic asset, reinforcing the importance of integrating ecological principles into business education to foster responsible decision-making.

Harvard Business School (HBS) – Corporate Biodiversity Management

Rationale: HBS's focus on biodiversity within sustainability leadership programs underscores corporations' critical role in environmental conservation. This inclusion is justified as it showcases how top business schools prepare leaders to address biodiversity issues within corporate strategies, thus influencing future practices in the business sector.

Northumbria University (NU)

Rationale: NU's emphasis on sustainability and social responsibility in its business programs illustrates a commitment to equipping students with the skills to engage with biodiversity-related challenges. The university's integration of sustainability principles into various business disciplines supports the development of ecocentric mindsets in future leaders.

Salford University (SU)

Rationale: SU's focus on sustainable business practices and innovative approaches to integrating environmental education into the business curriculum demonstrates a proactive stance on biodiversity issues. This inclusion highlights the university's role in fostering a deeper understanding of sustainability challenges among students.

Unilever – Sustainable Living Plan

Rationale: Unilever's commitment to biodiversity education and sustainable sourcing illustrates how corporate initiatives can drive broader change. This case highlights the practical application of sustainability principles in business operations and the importance of educating future leaders on the interconnectedness of corporate practices and environmental stewardship.

Patagonia – Regenerative Organic Certification

Rationale: Patagonia's initiative represents a pioneering approach to business strategies that enhance ecosystem health. This case study is relevant for illustrating how companies can adopt regenerative practices, thereby setting an example for integrating biodiversity into corporate models and encouraging innovative approaches in business education.

HSBC – Biodiversity Credit Market

Rationale: HSBC's financial model for supporting biodiversity projects exemplifies the innovative intersection of finance and environmental conservation. This case highlights the role of financial instruments in promoting biodiversity, demonstrating to students the importance of developing sustainable business practices that are economically viable.

This study is subject to several limitations inherent in desk-based research. Because our analysis was restricted to publicly available program descriptions, syllabi, and corporate training documents, we could not verify these materials' actual implementation or pedagogical depth. These resources may reflect aspirational goals rather than actual educational practices, particularly in corporate contexts where sustainability rhetoric may not align with training delivery. Moreover, the lack of empirical engagement—such as interviews with educators or learners—limits our ability to assess how students can internalize or interpret concepts like ecocentrism or biodiversity conservation. The search process was also language- and geography-bound, favoring English-language materials and institutions with a visible online presence. These constraints may have excluded relevant programs in other languages or underrepresented regions. While the study initially sought to examine a broader range of countries, the final selection of regions was influenced by the availability of publicly accessible content and language considerations. As a result, the final analysis centred on regions such as the United Kingdom, the United States, Sweden, and Canada. This purposive sampling strategy ensured that a diverse set of pedagogical models and biodiversity frameworks could be compared while acknowledging a key limitation. Some countries and regions do not make their educational content available publicly or in English, restricting their inclusion in the study. It is important to note that our study was based on desk research and publicly available websites and documents. The overview provided below is not exhaustive of all available programs, and many programs that potentially involve not just biodiversity topics, but an in-depth understanding of concepts and applications related to them, are beyond the scope of this investigation. This approach ensured a comprehensive examination of biodiversity education, drawing from various institutional models and regional contexts while acknowledging the constraints imposed by accessibility and language availability. This approach provided a valuable cross-section of current trends and discourses in business and biodiversity education. It also highlighted patterns and conceptual gaps that can inform future

empirical research and curriculum design aimed at integrating biodiversity into business education more effectively.

BIODIVERSITY IN EDUCATION

Based on our survey of published materials of thousands of business schools and programs, the absence of biodiversity topics from their respective curricula was the key factor in identifying the gaps in current business education and the practical applications of biodiversity-oriented strategies. Using this gap as our primary selection criterion, we examined what disciplines were employed and how they were employed, as much as this could be deduced from online sources. However, we realize that these searches are biased by availability. The limitation of scanning through online publications is that we had no access to the program materials outside of publicly available domains, so it is possible that programs that involved the biodiversity of related subjects were not publicly available.

Ecocentrism recognizes the intrinsic value of biodiversity and frames ecological integrity as a moral imperative (Rolston, 1985). Since the 1970s, this focus has influenced educational practices, ranging from conservation initiatives to outdoor education (Naess & Jickling, 2000; Van Matre, 1978). The Tbilisi Declaration emphasized the importance of ecological awareness, conservation empathy, and skills development to tackle environmental challenges (UNESCO, 1977).

The Our Common Future report (WCED, 1987) prioritized Education for Sustainable Development (ESD), which has since evolved into initiatives like the Decade of Education for Sustainable Development (UNESCO, 2017) and the United Nations Principles for Responsible Management Education (PRME) (Bartlett et al., 2020). These frameworks aim to integrate sustainability into business school curricula, yet the focus often remains on the economic benefits for students, rather than fostering critical ecological thinking (Castilla-Polo et al., 2023; Alimehmeti et al., 2024).

There is considerable potential for sustainability education to encompass "nature-positive" actions that range from nature regeneration to rewilding (Piccolo et al., 2022; Taylor et al., 2020; United Nations, 2022) in the context of education that connects learners to nature (Liefländer et al., 2013). Despite these opportunities to engage directly with biodiversity, ecosystems, and conservation strategies in corporate decision-making, business schools often fail to cultivate critical thinking beyond normative sustainable development (Bobulescu, 2021; Kopnina et al., 2024). Furthermore, no top-rated journals within CABS focus on biodiversity, conservation, or the environment, aligning sustainability education with job market demands and higher salaries (Alimehmeti et al., 2024). This focus is problematic, as the Sustainable Development Goals (SDGs) have proven insufficient in addressing major environmental crises such as biodiversity loss, climate change, and ecosystem decline, while business schools continue to focus on sustainable develop-

ment (Seto-Pamies & Papaoikonomou, 2020; Tallberg et al., 2022).

Notably, biodiversity is mentioned only once in the CABS report, where Paul Polman (CABS, 2021) stresses the need to live within planetary boundaries to avoid irreversible damage to biodiversity and ecosystems. Yet economic theory, with its emphasis on freedom of choice and the profit motive, remains the dominant ontological domain in business education (Moosmayer et al., 2019).

Payne (2022) highlights the "silences" within mainstream environmental education, entrenched in neoliberal and technocentric assumptions. Anthropocentrism, a human-centered perspective that sees humans as the primary agents of change and stewards of the environment (Taylor, 2017), is a key impediment to addressing the environmental crises (Piccolo et al., 2022; Washington et al., 2018, 2021). Some scholars argue that the SDGs are popular in business schools because they do not challenge existing corporate practices or the status quo, which remains steeped in anthropocentrism (Chiang & Chen, 2022; Seto-Pamies & Papaoikonomou, 2020; Tallberg et al., 2022).

Critics of the SDGs note that the rhetoric of sustainable development ignores the primary driver of environmental degradation: the growth economy (Moranta et al., 2022). Insufficient attention is given to decoupling economic growth from biodiversity loss (Otero et al., 2020), which in turn marginalizes the rights of non-human species (Kopnina, 2020; Tallberg et al., 2022; Visseren-Hamakers, 2020). This critique aligns with ecopedagogy, which advocates for "an education based on an ecological worldview" (Hung, 2021). As universities prepare future decision-makers, integrating ecoliteracy and ecopedagogy into business education could help account for the interests of ecosystems in multispecies relationships. Ecoliteracy involves understanding and applying ecosystem principles to foster sustainable communities (McBride et al., 2013). This approach resonates with the education advocated by The Limits to Growth report (Meadows et al., 1972), underscoring the need to safeguard well-being within planetary boundaries (Whiteman et al., 2013). By embracing these perspectives, business education can better prepare future leaders to address the intertwined challenges of biodiversity loss and sustainability.

CRITICAL THINKING AND THE SOCIO-ECONOMIC NEXUS IN BIODIVERSITY EDUCATION

Economic growth does not inherently lead to improved social welfare, as highlighted by the Easterlin Paradox, which posits that while wealthier individuals report higher happiness levels, increasing national wealth does not correlate with rising average happiness (Easterlin, 1974; James, 2008; Sen, 2000). Those with lower incomes, who often rely on natural resources and ecosystem services, find their circumstances worsened by ecosystem decline, thereby illustrating the vulnerability of poor populations (Washington, 2015). This calls for a redefinition of the anthropocentric paradigm and a shift towards an ecocentric worldview that values ecological integrity (Washington et al., 2021).

Research such as Herrington's (2020) comparative study of The Limits to Growth simulations reveals a concerning alignment between current global trajectories and scenarios that emphasize unsustainable practices. These insights can inform business curricula, providing students with a framework to understand the complex interplay between economic systems and ecological health.

Business education must integrate natural and social sciences insights to effectively address biodiversity loss, bridging disciplines like politics, ideology, and corporate strategy. The concept of degrowth serves as a critical transdisciplinary lens, challenging prevailing capitalist, colonial, and patriarchal structures (Fitzpatrick et al., 2022; Teasley & Butler, 2020; Hossain, 2024), but also relates to conservation policy, with more ambitious targets dictating that a substantial portion of terrestrial and aquatic habitats must be protected (Cafaro et al., 2017; Kopnina et al., 2022; Wilson, 2016). However, the survey of educational and training programs shows no direct links between degrowth and biodiversity (returning to the limitations of desk research, it does not mean that the links are not there; they were just not evident in the public domain).

Some programs we looked at show ad hoc courses or modules that link social science topics to conservation. Understanding the socio-economic implications of biodiversity conservation is essential. Students should explore how industries impact ecosystems and recognize the historical economic inequalities between the Global North and South that have contributed to unsustainable practices (Massarella et al., 2021; Vucetich et al., 2018). By fostering critical thinking, business curricula can encourage nuanced reflections on the complex relationships between economic systems and environmental degradation (Barton, 2001; Kincheloe et al., 2018).

Additionally, discussions of corporate responsibility can contextualize critiques of capitalism, enabling students to identify synergies between social justice and ecological objectives. Biodiversity loss disproportionately affects marginalized communities, reinforcing the need for a comprehensive analysis of economic development and ecological integrity (Johns, 2019; Bodasing, 2021). Incorporating themes of decolonization and justice can further enrich business education, helping students understand global disparities in sustainability. Documentaries like Schooling the World challenge conventional narratives of economic development, prompting critical reflections on poverty and environmental sustainability (Kopnina, 2023).

To tackle the root causes of biodiversity loss, students should engage with social sciences, exploring societal patterns of population growth and consumption. Trends such as rising voluntary childlessness and changing consumption habits challenge future business leaders to develop sustainable products that respect ecological limits (Cain, 2013; Lockwood et al., 2022; Washington, 2015).

Moreover, understanding consumer trends—such as the shift towards veganism—can present opportunities for sustainable innovation (Aschemann-Witzel et al., 2021). Inte-

grating biodiversity accounting into finance courses further aligns economic practices with sustainability goals (Atkins et al., 2018; Maroun & Atkins, 2018; Geneidy et al., 2023).

While critiques of capitalism are crucial, it is essential to recognize that environmental degradation is not confined to capitalist systems, and consumption patterns vary significantly across cultures (Blaikie & Brookfield, 2015). Addressing these dynamics within business education will connect marketing and finance with sustainability, providing students with relevant skills to navigate the evolving landscape of consumer and environmental interactions.

CRITICAL THINKING, ECOCENTRISM, AND DEGROWTH IN BUSINESS EDUCATION

Despite the growing relevance of degrowth in societal discussions, it remains largely overlooked in business education. Degrowth advocates for reducing environmental pressures and challenges to capitalism, neoliberalism, and consumerism, promoting a society based on autonomy, sufficiency, and care (Fitzpatrick et al., 2022). To cultivate critical thinking, educators should integrate concepts such as ecoliteracy and ecocentric frameworks that transcend anthropocentrism (Bobulescu, 2021; Taylor, 2017).

A promising avenue for mitigating resource overuse is the circular economy model, which promotes closed-loop systems that aim to decouple production from resource consumption (McDonough & Braungart, 2002; Graedel, 1996). The 10-R hierarchy prioritizes strategies to minimize resource use (Potting et al., 2017). Still, business education must also recognize the limitations of this model, particularly the challenges in fully decoupling economic activities from natural resources (Kopnina & Padfield, 2021).

Integrating insights from industrial ecology, life cycle assessment, and production-to-service shifts can inform degrowth strategies and sustainable business models (Dietz & O'Neill, 2013; Kopnina & Poldner, 2022). These concepts and, more importantly, applications invite critical engagement with sustainability challenges that future business leaders will face (Hankammer et al., 2021).

Critical pedagogy encourages scrutiny of power dynamics and societal norms, fostering awareness of existing hegemonies (Freire, 2000; Bobulescu, 2021). Ecopedagogy builds on this foundation by examining tensions between economic growth and environmental preservation, promoting critical ecoliteracy to mobilize individuals towards effective ecological politics (Gaard, 2008; Kahn, 2008; Orr, 2024). In practice, ecopedagogy can employ strategies such as the flipped classroom model, enabling students to engage with the material before class and, during class, participate in in-depth discussions and problem-solving (Jeong et al., 2021). Case studies in sustainable business courses often include debates and role-plays involving various stakeholders, exemplified by initiatives

like audit-based learning at the University of Worcester Business School and the integration of business management with conservation biology at Liverpool Hope University (Emblen-Perry, 2020).

Ecoliteracy connects conservation biology and biodiversity with business practices, helping students understand how their future industries can address ecological challenges. Direct drivers of biodiversity loss—such as land use, climate change, and pollution—coupled with indirect drivers like overconsumption and wealth disparity, underscore the critical role of business in mitigation efforts. Innovative pedagogical tools, including digital technologies like the "internet of animals," enhance student engagement with the complexities of biodiversity loss (Kays & Wikelski, 2023; Sukmawati et al., 2023; Geneidy et al., 2023). By adopting interdisciplinary approaches that integrate environmental, social, and economic perspectives, business schools can better prepare students to navigate the intricate challenges of biodiversity loss, advocating for a pedagogical shift that emphasizes critical thinking and ecocentric values in business education.

CASE STUDIES IN BUSINESS EDUCATION (FOR) BIODIVERSITY

Several real-world case studies illustrate both the gaps and opportunities for integrating biodiversity into business education, particularly through employee training and educational initiatives (see Figure 1). For example, Unilever's Sustainable Living Plan sets ambitious goals around biodiversity, aiming to reduce the environmental impact of agricultural sourcing by partnering with conservation groups and embedding sustainability into their supply chains. Unilever implements sustainable practices and invests in employee training programs that educate staff on sustainability principles and practices, ensuring that all employees understand their role in achieving these goals (Unilever, 2022).

Another relevant case is Patagonia's Regenerative Organic Certification initiative, which promotes biodiversity by supporting farming practices that enhance ecosystem health. Patagonia exemplifies the practical implementation of biodiversity-focused business strategies and invests in employee education programs that inform their workforce about sustainable agriculture and resource management practices. This training empowers employees to advocate for and implement these practices within their operations (Chouinard et al., 2023).

Moreover, HSBC's Biodiversity Credit Market, launched to provide funding for biodiversity projects, demonstrates the integration of biodiversity conservation into innovative business models. This emerging trend shows how financial products can be developed to both preserve natural habitats and generate economic returns. HSBC also engages its employees through training programs focused on sustainability and biodiversity, equipping them with the knowledge necessary to develop and promote these innovative financial solutions (HSBC, 2022).

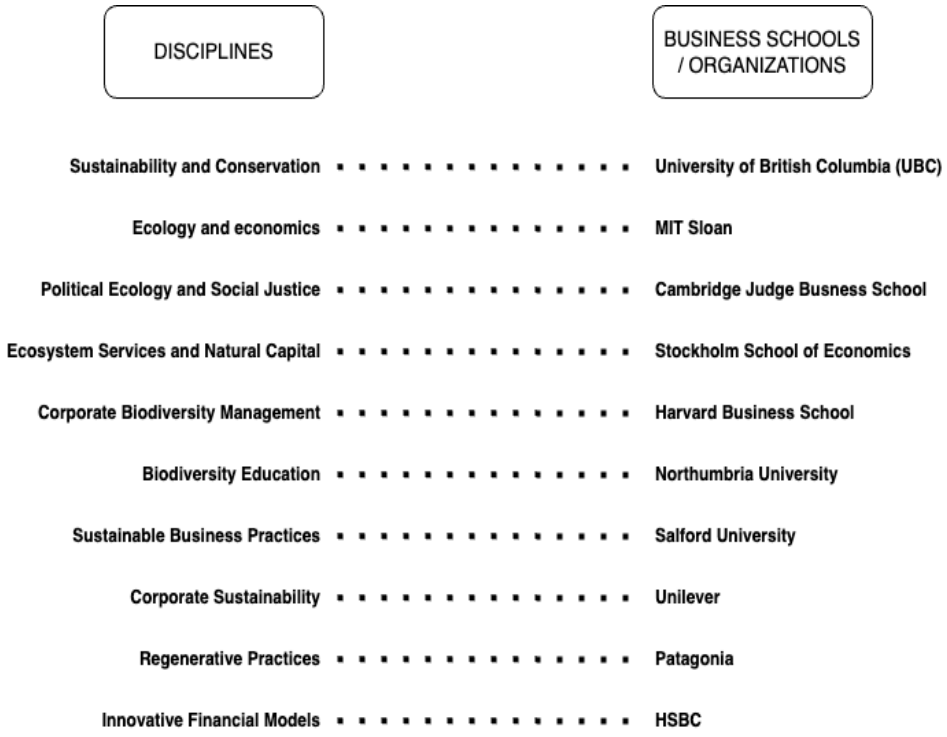

Figure 1. Business schools and organizations teaching biodiversity (by discipline)

These case studies highlight the essential role of employee education in fostering a culture of sustainability and biodiversity within organizations, but simultaneously raise red flags regarding the potential for greenwashing. Such initiatives offer valuable insights into how multinational corporations can take action to preserve biodiversity while achieving business objectives, but also underscore the need for biodiversity education within business schools to prepare future managers for such challenges. It still needs to be proven that these initiatives go beyond greenwashing, for example, by controlling how financial products work to preserve natural habitats, not just by accounting for damage, but by being proactive in nature regeneration or rewilding projects. Few business education programs provide in-depth case studies or frameworks that analyze such initiatives, leaving students underprepared to navigate these complexities. Hereby, we turn to university programs relevant to achieving these aims.

For example, at Said Business School in Oxford (https://www.sbs.ox.ac.uk/about-us/school/sustainability), complex questions concerning reconciling economic growth with its environmental and social impact are asked. The University of British Columbia, MIT Sloan School of Management, Judge Business School at the University of Cambridge, Stockholm School of Economics, Harvard Business School, Northumbria University, and Salford University illustrate the applications of biodiversity-oriented strategies in business education. Table 2 presents the interdisciplinary approaches to biodiversity in corporate education, highlighting both academic institutions and corporate initiatives.

Discipline	Business School / Organization	Approach
Sustainability and Conservation	University of British Columbia (UBC)	UBC's IBioS Collaboratory brings together experts from fields like forestry, botany, and public policy to address biodiversity loss, focusing on policy-relevant research and collaboration with various stakeholders to protect biodiversity.
Ecology and Economics	MIT Sloan School of Management	Sloan integrates sustainable development with economic innovation, focusing on how industries can innovate while reducing biodiversity impacts.
Political Ecology and Social Justice	Judge Business School, University of Cambridge	Cambridge explores how business interacts with ecosystems and social justice through programs that critique global inequalities and environmental policies.
Ecosystem Services and Natural Capital	Stockholm School of Economics (SSE)	SSE incorporates biodiversity into its sustainability curriculum, particularly in corporate sustainability and reporting practices.
Corporate Biodiversity Management	Harvard Business School	Harvard includes biodiversity considerations in its sustainability leadership programs, analyzing the role of corporations in environmental conservation.
Biodiversity Education	Northumbria University	Northumbria offers programs that focus on integrating biodiversity into business practices, emphasizing the importance of ecological literacy in corporate decision-making.
Sustainable Business Practices	Salford University	Salford's approach includes examining the role of businesses in biodiversity conservation, linking sustainability with social responsibility in its curriculum.
Corporate Sustainability	Unilever	Unilever's Sustainable Living Plan aims to reduce the environmental impact of agricultural sourcing by partnering with conservation groups and embedding sustainability into supply chains (Unilever, 2022).
Regenerative Practices	Patagonia	Patagonia's Regenerative Organic Certification initiative supports farming practices that enhance ecosystem health, exemplifying the practical implementation of biodiversity-focused business strategies (Chouinard et al., 2023).
Innovative Financial Models	HSBC	HSBC's Biodiversity Credit Market provides funding for biodiversity projects, demonstrating how financial products can be developed to preserve natural habitats and generate economic returns (HSBC, 2022).

Table 2. Interdisciplinary Approaches to Biodiversity in Corporate Education at Academic Institutions and Businesses

Some public-domain programs have offered researchers more insights into how some courses or modules are run. For example, one of the modules run by Northumbria University, Strategic Leadership for Responsible Change, is a required level 6 (final year before completion of the undergraduate study program) module, which uses interactive curricula elements to introduce a critique of SDGs and focus on biodiversity. With objectives including increasing class attendance, facilitating group work, and enhancing engagement, portfolio assignments were introduced linking seminar activities to assessments (for example, after an in-class debate, students write a position paper, after a role-play Shell game, reflecting on their role, etc.), so there are various activities linked to the marked assignment. Another objective was to build critical thinking (e.g., limitations,

tradeoffs) regarding previously studied concepts such as SDGs and circular economic principles (results reported in Kopnina, Black, Tracy, 2024; Kopnina et al., 2024).

In varying degrees, these programs encourage students to engage with complex socio-economic and environmental issues, ensuring that business decisions are aligned with biodiversity conservation goals. However, without interdisciplinary and transdisciplinary approaches in business education, biodiversity focus will struggle to gain mainstream acceptance within corporate strategy.

Further, several strategies are outlined in Table 3 below. The table presents a comprehensive overview of actionable strategies that align with degrowth, specifically focusing on fostering a steady-state economy and a well-being economy. By outlining specific actions under each strategy, we illustrate how businesses and educational institutions can contribute to a paradigm shift away from traditional growth metrics towards a more sustainable, equitable, and ecologically balanced approach. This aligns with the book's overarching themes, emphasizing the need for a radical rethinking of economic models in business education and practice, and highlights the critical role of integrating ecocentric principles, stewardship, and social equity into curricula and business strategies. The strategies presented serve as a practical framework for educators and business leaders to embrace and implement sustainable practices, reinforcing the importance of interdisciplinary approaches in addressing complex sustainability challenges.

Strategy	**Action**
1. Redefine Success and Progress	Shift Metrics: Move beyond GDP and financial growth as primary indicators of success. Emphasise well-being, ecological health, and social equity (Costanza et al., 2014).
	Measure Well-Being: Implement alternative indicators such as the Human Development Index (HDI), Genuine Progress Indicator (GPI), or Happiness Index (Jackson, 2009).
2. Promote Sustainable Business Models	Circular Economy: Adopt models that prioritise resource efficiency, waste reduction, and closed-loop production systems Potting et al., 2017)
	Localisation: Support local economies and reduce reliance on global supply chains, minimizing transportation emissions and fostering community resilience (Klein, 2014).
3. Encourage Resource Efficiency	Dematerialisation: Focus on reducing material and energy use through design innovations and improved processes (Dietz & O'Neill, 2013).
	Product-to-Service Models: Transition from selling products to offering services, such as leasing instead of selling (Kopnina & Poldner, 2022).
4. Integrate Ecocentric Principles	Ecoliteracy: Incorporate ecological education into business practices and curricula, highlighting interdependence between human and ecological systems (McBride et al., 2013).
	Ecocentric Business Practices: Develop strategies that respect ecological limits and promote environmental stewardship (Gray, 2010).
5. Foster Social Equity and Justice	Equitable Distribution: Address inequalities by promoting fair distribution of resources and wealth (Piketty, 2014).
	Community Engagement: Involve local communities in decision-making to ensure their needs and perspectives are considered in business practices (Friedman, 2006).

6. Reevaluate Economic Models	Steady-State Economy: Promote the steady-state economy, focusing on maintaining ecological balance rather than perpetual growth (Daly, 1991).
	Well-Being Economy: Investigate the well-being economy, focusing on quality of life and ecological health rather than increasing economic output (UN, 2022).
7. Adapt Business Education	Curriculum Development: Integrate degrowth and sustainability principles into business education, encouraging critical thinking about economic models (Bobulescu, 2021).
	Interdisciplinary Approaches: Adopt interdisciplinary teaching methods combining insights from economics, ecology, and social sciences (Haeck & Vandenberghe, 2017).
8. Policy and Advocacy	Support Legislation: Advocate for policies supporting degrowth principles, such as promoting sustainable practices and social equity measures. (Hawken, 2017)
	Public Awareness: Raise awareness about degrowth benefits through public campaigns and collaboration with NGOs (Kallis, 2011).

Table 3. Strategies for Transitioning to a Steady-State and Well-Being Economy

DISCUSSION: INTEGRATING ECOCENTRISM INTO BUSINESS EDUCATION

The case studies analyzed illustrate diverse intra-, inter-, and transdisciplinary approaches to biodiversity education in business contexts. Each example highlights the need for integrated strategies that prepare students to tackle sustainability's multifaceted and interdisciplinary challenges in the corporate world. In this way, we seek to critique the narrow scope of traditional business education on sustainability, which often prioritizes economic growth and profitability over holistic approaches that consider the complex interactions between business activities and ecological systems. Without these approaches, innovative solutions risk being absorbed into mainstream corporate strategies, underscoring the importance of educational programs that bridge disciplinary gaps. Interdisciplinarity necessitates collaboration between academic institutions and non-academic partners to bridge the gap between theory and practice. Practical sustainability strategies exemplified by initiatives from Patagonia, HSBC, and Unilever demonstrate the value of engaging with external stakeholders such as NGOs, local communities, and financial institutions. However, though engaging non-academic stakeholders can foster practical solutions, tensions often arise, and as Laasch et al. (2020) highlight, the aspiration for transdisciplinary research in sustainability is high, but its implementation is lacking. We recommend involving more interdisciplinary specialists in developing and instructing corporate education and training programs to mitigate this.

Integrating ecocentrism into business education poses significant challenges due to its inherent conflict with the dominant neoclassical economic paradigm. Ecocentrism values biodiversity intrinsically, often clashing with the capitalist and neoliberal ideologies that underpin conventional business practices (Bocken & Short, 2021). The prevailing business model commodifies nature, viewing biodiversity primarily as a resource for exploitation, undermining the ethical imperative to protect ecosystems.

However, incorporating concepts like degrowth is feasible without abandoning the profit

motive (Kopnina & Poldner, 2021). Responsible profit generation can align with ecocentric values, as seen in initiatives like Unilever's Sustainable Living Plan, which strategically integrates biodiversity considerations while maintaining profitability. This highlights the necessity for business education to equip future leaders with the skills to navigate sustainability complexities in profit-driven environments.

Currently, business curricula often overlook conflicts between economic development and conservation (Eisenmenger et al., 2020). The SDGs frequently prioritize economic growth over ecological integrity, neglecting the negative impacts of technological advances on biodiversity (Moranta et al., 2022; Garnett et al., 2013). Furthermore, a materialistic worldview can hinder Education for Sustainable Development (ESD), limiting its effectiveness in promoting ecocentric values (Giacalone & Thompson, 2006). To address environmental challenges effectively, education must align with broader policy frameworks and embed ecocentric values into curricula, equipping students with practical skills for real-world solutions, as emphasized in the Tbilisi Declaration (1977). The current model of business education often reduces biodiversity to mere ecosystem services, perpetuating an anthropocentric bias and remaining uncritical of growth strategies. This critique is reflected in mainstream business scholarship, which tends to reinforce a neoliberal narrative favoring market-driven sustainability instead of exploring connections between business and biodiversity through strategies such as land-sharing to land-sparing, advocated by conservation scientists (Panwar et al., 2023).

To prepare future business leaders effectively, business schools must move beyond traditional SDG rhetoric and embrace alternative economic models like degrowth or post-growth economies. This shift is vital for fostering values that prioritize more than just profit accumulation. Initiatives such as Patagonia's Regenerative Organic Certification and HSBC's Biodiversity Credit Market exemplify how corporations can adopt innovative, biodiversity-focused strategies aligned with ecocentric principles. Educational programs must comprehensively analyze these initiatives, ensuring students are well-equipped to navigate the complexities of sustainable business practices.

Incorporating ecopedagogy and ecoliteracy into business curricula can enhance personal and professional reflexivity, empowering students to drive meaningful societal change. Business education can cultivate leaders who prioritize long-term sustainability over short-term gains by emphasizing the interconnectedness of ecological integrity and economic viability through concepts like dematerialization. This holistic approach is essential not only for biodiversity conservation but also for the ethical evolution of business in an increasingly complex global landscape.

CONCLUSION

This article has examined how integrating diverse disciplinary insights can deepen the understanding of biodiversity loss within business education. We critiqued current cur-

ricula's overreliance on the Sustainable Development Goals (SDGs) (intradisciplinary approach). We proposed incorporating perspectives from both traditional business fields, like marketing and finance, and less conventional disciplines, such as biological conservation and sociology (interdisciplinary approach). We have discussed how education can be delivered at different levels, from corporate and in-company training to universities. We highlighted initiatives like Unilever's Sustainable Living Plan and Patagonia's Regenerative Organic Certification (a transdisciplinary approach in this sense because engaging with non-academic partners to implement practical sustainability strategies bridges both theory and practice) to illustrate how businesses can effectively integrate biodiversity into their operations. These cases exemplify the practical application of theoretical concepts, showing how biodiversity can serve as a source of innovation.

We explored how teaching subjects such as marketing principles can be applied to analyze shifts in consumption patterns and how financial frameworks can evaluate biodiversity and extinction accounting. We have also discussed how non-traditional business subjects enrich the business curriculum by providing a multidimensional approach to understanding biodiversity.

Incorporating biological conservation into business education emphasizes the significance of biodiversity and fosters sustainable practices within organizations. It is essential to embed critical discussions around ecological challenges—such as biodiversity protection, soil erosion, freshwater depletion, and deforestation—within curricula. Utilizing interactive and participant-driven strategies typical of ecopedagogy, critical studies, and ecoliteracy will equip students with strategic and leadership skills essential for sustainable business practices, environmental ethics, and policy development.

Further research can include a comparative analysis of how different institutions incorporate interdisciplinary perspectives, such as biological conservation and industrial ecology, into their business programs. Longitudinal studies, including follow-ups with alumni, could reveal how providing students with a sense of agency and responsibility for environmental conditions strengthens the connection between awareness, knowledge, and practical application beyond their formal education. Fostering this connection is crucial for preparing future business leaders to navigate the complexities of sustainability and biodiversity in a rapidly changing world.

FUNDING: This research received no external funding.

CONFLICT OF INTEREST: The authors declare no conflict of interest.

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ARTICLE HISTORY: Received 2025-01-08 / Accepted 2025-06-24