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Sustainability in business education: A systematic review and future research agenda

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Sustainability in business education:

A systematic review and future research agenda

Abstract

Purpose – This paper clarifies how business education has and should incorporate more resources, policies, and stakeholder engagement towards the incorporation of sustainability, by conducting a literature review on sustainability in business and international business education and proposing future opportunities for researchers and practitioners.

Design/methodology/approach – We take a systematic, qualitative analysis approach to evaluate multidisciplinary literatures on sustainability in business education. We identify 192 qualifying articles published in 68 journals between 2015 and 2023.

Findings –We propose five categories of education solutions. Four of them are integrated, in two macro-micro levels: university (stakeholders and shared-mindset change), and student (pedagogical methods and curriculum); and one at meso level: international business (holistic integration) serving to unify the university and student levels.

Research implications – Our review highlights the value of applying a holistic approach and interdisciplinary pedagogical methods in future research on sustainability education in business school, to effectively prepare future business leaders to contribute to a more sustainable future.

Practical implications – Insights from this review can usefully guide scholars and program directors in their future research and administrative efforts toward business curriculum design, stakeholder management, and policy making.

Social implications –Our findings highlight how by embracing holistic perspectives, proper policies, and self-awareness, business education shapes the mindsets and skill sets of the next generation of socially conscious practitioners.

Originality/value – Our review stands out as one of the few that offers a forward-looking trajectory for the adaptation of international business education in response to sustainability challenges, through a holistic perspective.

Keywords – Education, Sustainability, Business School, Review, International Business

Paper type – Review paper

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Introduction

Promoted by the United Nations Education, Scientific and Cultural Organisation (UNESCO, 2022), and investigated in the last decades (Chang, Kidman and Wi, 2019; Shephard, 2020), higher education for sustainability (EfS) suggests the importance of integrating sustainability topics into curricula and research agendas (Johnston and Johnston, 2012). The mission of EfS is to expand initiatives by "engaging learners with innovative content and pedagogy around themes of sustainable development" (Chang *et al.,* 2019, p. 1). Integrating EfS into teaching is critical to meeting the society and organisational needs, by developing human capabilities with essential skills, understanding, and knowledge (Davim and Leal Filho, 2016). Since restraining unsustainable behaviour reduces environmental damage and supports sustainable development, education on this topic is paramount (Badea *et al.,* 2020). Hence, a higher education agenda in sustainability pedagogy becomes an imperative (Earl *et al.,* 2018).

The connection between education and sustainability took many forms, such as sustainable Higher Educational Institutions (HEIs) and higher education for sustainable development (Leal Filho *et al.,* 2018). Among those, *education for sustainable development (ESD)* and *higher education for sustainability* have been the most applied. The first lens of EfS emphasizes an educational approach that equips people with the skills to address and solve sustainability challenges (Badea *et al.,* 2020). It acknowledges EfS as a transdisciplinary field, needing more than knowledge transfer for sustainable behaviour (Earl *et al.,* 2018). EfS, preferred over the broader ESD, involves active promotion and engagement, embraces adaptive pedagogy (VanWynsberghe and Herman, 2016), and is widely referenced in sustainability education literature (Johnston and Johnston, 2012; Shephard, 2008).

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EfS has broadened from environmental studies to include interactions between human society and life-supporting resources, fostering interdisciplinary synergy (Johnston and Johnston, 2012, p.1). Institutions like the Association for the Advancement of Sustainability in Higher Education (AASHE, 2021) have led efforts in sustainability transformation since 2005, creating frameworks for measuring university sustainability globally. The growing focus on EfS signals an ongoing transformation in academia and beyond.

Studies highlight challenges in EfS in business, noting its critical role in shaping future societal and environmental impacts (Chang *et al.,* 2019; Wu and Shen, 2016). Multinational corporations, influencing diverse regions, are scrutinized for their responses to global issues (Elo, Torkkeli and Velt, 2022; Kolk *et al.,* 2022). Despite increased corporate responsibility, gaps persist in EfS's role in international business education and leadership quality (Tulder *et al.,* 2022). Understanding how sustainable practices vary internationally is vital (Ioannou and Serafeim, 2023). Global competencies of today's students can lead to sustainable, ethical, and inclusive business strategies tomorrow (Elo *et al.,* 2022). Business education is thus shifting to a global perspective, preparing professionals for diverse contexts, including areas with institutional voids.

Extant research indicates that: (i) sustainable development education is inadequately incorporated into higher education; (ii) academics need collaborative methods to infuse sustainability into curricula, embracing its epistemology and diverse perspectives; (iii) academics' values significantly shape students' capacity to drive a sustainable future (Leal Filho *et al.,* 2018: 286). The UN Sustainable Development Goals (SDG) offer a prime chance to enhance global sustainable education (Badea *et al.,* 2020, p. 3), advocating for a comprehensive educational approach (Spychalski, 2023). Despite a growing body of work on

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EfS, there's a critical need for its better integration in university curricula, research, and initiatives (Badea *et al.,* 2020; Earl et al., 2018), where education for sustainability has seen a significant rise in its extent and quality.

Research has thus far focused on either promoting environmental management of universities by greening and reducing their ecological footprint (Wu and Shen, 2016) or pedagogy, learning, instruction, community outreach and partnerships (Wals, 2014). However, given that business students urgently need to incorporate broader perspectives from around the world (Ortiz, 2004; Kolk *et al.,* 2022), sustainability education of these global leaders has become critical (Kourula *et al.,* 2017). Our review aims to analyse literature on EfS in business, between 2015 and 2023, to address three related research questions: (i) what the current state of knowledge on sustainability education in business (or management) schools is and which themes are discussed? Based on this initial question, we will further derive insights about the following questions of (ii) what the knowledge frontier issues in research on sustainability education in business schools are? and (iii) how can future research contribute to sustainability education in business schools?

Through exploration of these questions, this study sheds light on the role of international business (IB) field in contributing to EfS and conversely, the way in which EfS enhances IB education. The latter plays a particularly crucial role in preparing future leaders to address pivotal concern in today's globalized world, with businesses facing increasing pressure to incorporate sustainable practices into their national, and particularly, their international operations (Kourula *et al.,* 2017).

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Methodology

Search strategy

Since our goal in this review was to establish the current state of knowledge regarding

sustainability education in business schools, our search for literature on EfS in the context of

business schools began by listing general keywords. Among these, keywords such as

education, sustainability, business, and teaching were entered into a scientific literature

database called EBSCO Business Source Complete. We used the following Boolean search:

"educ* AND sustainab* development" OR "sustainab* AND teaching OR learning" OR

"sustainab* AND management OR business". After revising the initial results, we used a

further search on "educ* AND sustainab* AND teach*". The literature on EfS was selected

for review only if it met all the following criteria: peer-reviewed; published between January

2015 to December 2023; publication type: academic journal; and language: English. The

initial search yielded 1488 papers. We then filtered these papers using business/management

education, business schools, or business students which lead to the list of 308 papers,

followed by filtering them by the time frame (2015-2023) with a final selection of 192 papers

in 68 journals (see Table 1 in Appendix). Overall, we observed that most articles dealing with

the topic of integrating EfS in management education seem to have been published in outlets

outside of the ranking system (54 articles; NA=28.13 %) or in journals with lower rankings

(69 articles; 1=35.94 %; 29 articles; 2= 15.10%). High-ranking journals only published a

minor fraction of these papers (30 articles; 3=15.63 %; 10 articles; 4/4*=5.21 %).

Interestingly, the number of publications has fluctuated over the years, perhaps influenced by

various factors or global events such as the SDGs being published in 2015, and COVID-19

pandemic. Hence, the years 2020-2023 marked a particularly high frequency of publications

(Close to 81 articles compared to 19 in 2019), as depicted in Figure 1 (see Appendix).

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As Figure 2 (see Appendix) shows, several studies focused on particular countries and/ or continents. For instance, Australia (Voola, Carlson, and Wyllie, 2018; Maritz and Foley, 2018), India (Kola, 2019), Peru (Dejo Esteves and Parodi Parodi, 2016), and EU countries (Borglund *et al.,* 2019; Peschl *et al*., 2023; Seraphin *et al.,* 2021), among others.

Review process

We used a content analysis, and the criteria for codifying was based on an open coding scheme and procedure (Tranfield *et al.,* 2003). During the preliminary phase, one coder initially developed and tested the coding scheme on a sample of 30 articles, then another coder performed the same scheme on the full sample of 192 articles and found patterns for five main categories (shared-mindset change, holistic integration, curriculum, pedagogical methods, and stakeholders). We divided the studies among the six authors of this literature review for coding. Each of us coded 35 studies or more for up to three main categories linked to each study which were derived from the appointed five main categories explained in the next section and depicted in Table 2 and 3, both in the Appendix section. Table 2 (thematic patterns and frequency), and Table 3 provide descriptions of the five categories. Table 3 (see Appendix) also provides a list of representative studies and their main findings relating to each of the five categories. We integrate findings under a multi-level approach (Buckley and Lessard, 2005; Šilenskytė and Smale, 2021), at macro (university level), and micro (student level). Two of the five categories pertain to university level, which encompasses stakeholder engagement and shared-mindset change; two relate to the student level, which encompasses

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pedagogical methods and curriculum. The fifth category explains the importance of IB in

business schools, through a 'holistic integration'. At meso level, the holistic view serves to

bridge and integrate both university and student levels, explaining (i) the critical importance

of IB on EfS within business education; and (ii) the interaction between macro and micro

level processes (Šilenskytė and Smale, 2021). It should be also noted that the concept of

mindset is analysed at macro level, based on broad assumptions about top managers at the

industry level, specifically in relation to mental models for strategic decision-making, which

are referred to as shared-mindsets (Phillips, 1994). Additionally, the curriculum concept is

studied under the micro level or at the student level, focusing on delivering specific

knowledge and skills to students, based on particular capabilities needed for a successful

delivery, a process known as capability integration (Lyons, 2012).

We have created a research protocol which was used initially as a plan for conducting the

literature review, and later was populated and amended gradually during each stage of the

review process to meet the transparency requirements. A code relations matrix is depicted in

Table 4 (see Appendix), based on the thematic patterns of the final selection of articles used

in the literature review.

Findings

The studies in our sample can be depicted along five categories which we discuss below. As

the five categories are subsequently discussed, it is important to highlight that, in some cases,

these categories are interconnected. The discussion section provides a further analysis of the

findings, depicting a future research agenda and the need for the adaptation of IB education to

be able to fit with global challenges.

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University - stakeholders (internal/external)

The interaction between internal and external stakeholders are managed at university or macro level. Internal stakeholders such as managers, faculty and students are key players for finding allies and leading change. Faculty's personal sustainability behavior at the university level is crucial to fostering credibility and leading by example (Kanashiro, Rands, and Starik 2020). Students and their value priorities and attitudes towards sustainable development are critical (Bask *et al.,* 2020) and student initiatives provide exciting potential as implementation forces (Borges *et al.,* 2017). However, trust in stakeholders seems to be a key factor when implementing sustainability into management education, particularly (i) if stakeholders are not just focused on financial aims; (ii) are willing to integrate sustainability issues into the syllabus of the courses (Delgado-Márquez *et al.,* 2016); and (iii) are able to develop teaching and research by collaborating with external stakeholders (Arevalo, 2020). For example, while sustainability and gender are raising in importance globally and research suggests that "mandatory gender education is needed to equip management students as they enter diverse and equal opportunity working environments" (Arevalo, 2020, p. 852), collaborations with internal and external stakeholders are needed to facilitate communication and analysis of gender issues when voices hereto have been silenced (Arevalo, 2020).

The collaborations with other networks, especially educational networks such as PRME is quite prominent in this category. The effectiveness and potential for change of partnerships between education institutions and PRME are thus frequently raised in literature (Burchell, Kennedy, and Murray 2015; Haertle *et al.,* 2017; Hauser and Ryan, 2021; Tahmassebi, and Najmi, 2023). Other multilateral partnerships such as the ones between the United Nations Office for Disaster Reduction's (UNISDR), Private Sector Alliance for Disaster Resilient Societies (ARISE), and several business schools are also mentioned (Sarmiento, 2016).

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Another prominent topic is the interaction between practitioners and academic institutions (Kriz *et al.,* 2021). This bond is vital, especially for creating educational programs which cater to market needs (Caskey and Thomé, 2020). This way, sustainability-related knowledge and tools can easily be integrated in companies (Talbot *et al.,* 2021).

Furthermore, creative methods at the intersection of disciplines provide fertile ground for action (Schulz *et al.,* 2021). To a lesser extent, spillover effects regarding community and society are investigated (Willatt, 2018). In brief, the collective commitment and collaboration of internal and external stakeholders are vital in reshaping higher education in business and management schools to prioritize sustainability, ultimately producing graduates who are well-equipped to tackle the global challenges of our time. Likewise, these intense interactions between stakeholders would increases the potential to develop comprehensive IB programs towards EfS.

University - Shared-Mindset change

Based on the shared-mindset concept or broad-based assumption (Phillips, 1994) of management and faculty members in business schools, findings suggest that interactions among university management and faculty members are critical to fostering a sustainable mindset within higher education. A review of 65 studies shows that this shared-mindset shift is crucial for EfS in business schools, addressing topics from pre- and post-globalization impacts on business ethics and values (Naik *et al.,* 2020) to the integration of SDGs in education (Schulz *et al.,* 2021) and the link between academic research and practical business applications for global sustainable solutions (Wells and Nieuwenhuis, 2017).

In relation to teaching approaches to management, the foci include critical and ethical thinking of students, reversing the tendency of materialism and individualism (Dyck, 2017);

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the impact of contextual, organizational and curricular elements contributing to the presence

of sustainability in higher education in business (Figueiró, da Silva and Philereno, 2019); the

importance of a transdisciplinary approach to business education integrating a rational-

analytic mode of thinking and an emotive-holistic understanding of the human mind (Reficco

and Jaén, 2019); the use of different educational paradigms, such as the Ledesma-Kolvenbach

model with key elements in business strategies (sustainability, human dignity and social well-

being), or the Sustainability Literacy Test (Aguado *et al*., 2016).

Research has explored student perceptions of environmental sustainability (AL-Mutairi, 2021)

and the development of sustainable frameworks by universities for stakeholders and ethical

mindset building (Cuyegkeng *et al.,* 2021; Weybrecht, 2017). Business education is being

reformed to instil responsible mindsets and skills in future socially aware professionals (Parris

and McInnis-Bowers, 2017), though the profit-oriented approach has faced criticism

regarding schools' values, PRME commitments, and the need for leaders skilled in managing

sustainability challenges (Baden and Higgs, 2015; Roos, 2017). Further, research underscores

the necessity of integrating sustainability and PRME in academia to foster equity, inclusion,

and sustainability (Borges *et al.,* 2017; Moratis, 2016; Garanzini and Santos, 2021). Studies

also examine how responsible management education is understood and implemented by

faculty (Mousa *et al.,* 20120), the role of corporate stakeholders in planet sustainability and

citizenship (O'Connor and Myers 2018), and the need for new competencies for sustainable

change (Haney, Pope, and Arden, 2020). Additional work explores the ties between religion,

spirituality, and sustainability ethics (Sabbaghi and Cavanagh 2015), advocating for

sustainability education at all levels in business schools (Molthan-Hill *et al.,* 2020).

Managerial mindsets that allow change, such as the intertwined connection between economic

activities through global value chains in IB, would allow to understand the implications of

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business decisions in different parts of the system (Fritz and Cordova, 2023), promoting an integrative as well as responsible sustainability approach.

Student - Pedagogical methods

At the student or micro level, we also found curriculum to intertwine with pedagogical methods (e.g., Seatter and Ceulemans, 2017). For example, Singhal, Gupta, and Mittal, (2018) performed the importance-performance analysis (IPA) on different approaches included in the PRME, and found that using case studies, lectures by experts, and internships on sustainability were showing better results than other methods. A classification framework based on literary genres in teaching cases facilitates the development of cognitive and emotional learning which is needed to manage businesses sustainably (Montiel, Antolin-Lopez, and Gallo, 2018), while contemporaneous teaching cases can be used to analyse aftermaths of natural disasters (Grayson, 2016).

Prado et al., (2020) examine the effectiveness of a simulation vis-à-vis a case-based method to teach sustainable development as part of new teaching approaches through the use of technology. This can prepare students to work in an increasingly dynamic market environment. Another approach is to use business simulation games to bridge the gap between existing skills and industry-required skills (Goi, 2019). Such simulation-based learning environments have been used to represent the development of an energy service company venture under varying conditions of simulator transparency (Capelo, Pereira, and Dias, 2021). Simulation helps business education to go beyond traditional teaching models, develop interdisciplinary approaches, and foster skills development to enhance education for sustainable development (Sierra, 2020). Wade and Piccinini, (2020) explain that scenario planning applied in the context of management education offers teachers of sustainability a

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way to encourage creativity while developing student knowledge, skills, and abilities. Transdisciplinarity serves to confront students with different modes of thinking, imagining and feeling and can help them to develop greater self-awareness, critical reflection, and creativity (Gröschl and Gabaldon, 2018). Lorange and Thomas (2016) suggest that a mix between distance self-learning approaches and face-to-face learning will increasingly become the norm, for that reason improving pedagogy along with "friendly" architecture of learning spaces is critical for encouraging dialogue and closer interaction between students and professors.

Dagar, Pandey, and Navare (2020) propose that ethical grounding in yoga-based practices can help promoting altruistic behavior and going beyond the self-oriented perspective to future managers. On the other hand, O'Connor and Myers (2018) identify key values and practices used in the Jesuit business school network by applying Ignatian pedagogical practices (cases, discussion, assignments, experiential activities, guest speakers, papers) towards the formation of 21st century business leaders. Students can develop and enact a critical and responsible mentality towards business by being exposed to moral philosophy of care (Heath, O'Malley, and Tynan, 2019), or community-based competences by being involved in a real-time community-based project (Dal Magro, Pozzebon, and Schutel, 2020). The use of a practice-based learning methodology and the provision of community services, results in greater student engagement, less boredom, and satisfaction in solving a real problem (Matzembacher, Gonzales, and do-Nascimento, 2019).

It is necessary to educate students to be integrated catalysts, to meet current sustainability challenges (Akrivou and Bradbury-Huang, 2015). Several studies discuss pedagogical methods in connection to specific SDGs. There are intellectual and personal development

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benefits of addressing poverty issues in business schools' teaching, learning, and curricula

(Neal *et al.,* 2017). In conclusion, by adapting pedagogical methods to emphasize

sustainability, educators can equip students with the holistic understanding and practical skills

needed to drive positive change in the global business landscape, ensuring a more sustainable

and socially responsible future. Moreover, in terms of IB education, the design of pedagogical

methods could include approaches to cross cutting topics such as global value chains, cross

cultural management, and systemic perspective among others.

Student - curriculum development

Grounded in the need to deliver specific knowledge and skills to students, we analyse

curriculum development under the micro level (Lyons, 2012). Students need a curriculum

development in higher education that integrates key sustainability topics such as social

responsibility, environmental stewardship, and ethics, with a particular emphasis on real-

world applications and project management (Aragon-Correa *et al.,* 2017). Building

partnerships between academia and industry, sharing resources, and aligning pedagogy with

sustainability goals are essential for developing the competencies required in today's business

leaders, including systems thinking and collaboration (Jose et al., 2016). Innovations in

curriculum design, like integrating the SDGs and concepts like de-growth, without

overburdening students, are also suggested to enhance engagement with social and

environmental issues (Venkiteswaran and Cohen, 2018; Kopnina *et al.,* 2019). Additionally,

there is a call for business schools to refresh their curricula to meet industry demands and

bridge the gap between sustainability rhetoric and practice (Yadav and Prakash, 2022;

Snelson-Powell *et al.,* 2020). Courses designed to shape socially conscious practitioners and

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foster innovation reflect a shift towards business as a catalyst for positive change (Parris and McInnis-Bowers, 2017).

While Deno, Sirianni, and Stathopoulos (2019) examine how the Triple Bottom Line and PRME guide sustainability in business curricula, emphasizing economic, social, and environmental integration and Moratis and Melissen (2022) scrutinize Responsible Management Education's (RME) role in sustainable development, linking sustainable and media literacy (Schulz *et al.,* 2021), Thompson and Lawson (2018) identify six PRME's challenges to business schools to prepare leaders for an inclusive, sustainable economy. Beyond formal education, students often craft their own learning through student organizations to address gaps in the formal curriculum (Borges *et al.,* 2017). Høgdal *et al.* (2021) identify a disconnect between business schools' stated commitments to RME and the actual student experience, noting that while RME is emphasized in the curriculum, the *hidden curriculum* may undermine its perceived relevance. To address these challenges, Deer and Zarestky*,* (2017) discuss incorporating CSR into business school curricula using critical thinking tools: a decision-making model, a funnelling exercise, a root problems activity, and reflection and meta-reflection. Thomas (2018) proposes a sustainability course to fill in the gap in the current curriculum by providing conceptual tools for understanding the issues, different stakeholders, and functional areas. Taj *et al.,* (2016) offer a project about multifunctional, multidisciplinary perspectives of sustainability, innovation, and emerging markets.

Challenging students to examine factors of change in business-as-usual to achieving sustainability can also have transformative potential (McGhee and Grant*,* 2016). These future business leaders find the need of altering both their individual behaviour and their approach to

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business (McGhee and Grant, 2016). Transformational learning via critical reflection leads to changes in attitudes and behavioural intentions in career choices (Voola *et al.,* 2018; Singhal *et al.,* 2018). A transformational learning program consisting of activities in the classroom and outside activities incorporating cognitive, affective, and conative aspects of student behaviour, can be used to effectively transform their impulse-buying behaviours (Sermboonsang *et al.,* 2020) and reducing the impact of fast fashion on the environment. The Jesuit business education and ignatian pedagogy which consider the emotional and spiritual dimensions of learning, along with the cognitive one, are used to educate professionals committed to working for a more sustainable world (Gimenez, 2021).

Organizations have become global since they have suppliers, customers, or business partners abroad, so the IB curriculum would gain more relevance by embracing a comprehensive perspective of sustainability. This entails reimagining curricula to integrate sustainability principles, environmental ethics, social responsibility, and global citizenship into core courses.

IB - Holistic integration

IB is an essential part in the implementation of sustainability in business education. Globalisation aspects have a huge impact on higher education institutions, in which IB's management and faculty are key agents in educating of future leaders (Žalėnienė and Pereira, 2021). Helping students understand global challenges is an effective solution to developing future professionals who will be implementing sustainability principles (Žalėnienė and Pereira, 2021). However, findings reflect that EfS requires a holistic view, particularly within the IB field. As IB-holistic approach integrates both university and student, or macro and micro levels, we propose this category within a meso level.

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The holistic approach involves broader, multi-level perspectives, as the concept involves business, higher education, and students, becoming a key category that integrates the university and student levels. This is represented in the overall reflection of management education against the backdrop of the grand challenges of our time (Abdelgaffar, 2021; Figueró *et al.,* 2022; Tahmassebi and Najmi, 2023); and innovation of management education to integrate Eastern and Western ideas (Joshi, 2018). In addition to these broader frameworks, single theoretical concepts are being applied such as practical wisdom or the definition of scholarship by Ernest Boyer (MacAulay *et al.,* 2020). All these theoretical foundations deal with the construction of overarching frameworks to facilitate integration on various levels, such as the institutional level by drawing on sustainability centers (Slager *et al.,* 2020), the curricular level against the backdrop of global events such as Covid-19 (Mousa, 2021), or the need for more holistic learning experience to solve global sustainability problems (Montiel et al., 2018).

Despite the theoretical considerations explored above, there is ample criticism and concern about the status quo of implementation and transformation (Cornuel and Hommel, 2015; Maloni *et al.,* 2021) versus the ambition and desired image of successful integration. In case higher education institutions fail to accomplish said transformation, questions about the overall legitimacy of schools might potentially soar (Trkman, 2019). Acknowledging the joint challenges along the way (Doherty, Meehan, and Richards, 2015) business schools might aim for an intensified collaboration among themselves (Rive *et al.,* 2017), at university and student levels, strengthening attempts to integrate transdisciplinary practices (Gröschl and Gabaldon, 2018). We highlight the importance of the holistic approach at meso level, to address EfS, by trying to integrate the institutional (university) with curricular (student) macro-micro levels (Šilenskytė and Smale, 2021). We propose that this approach (i) plays a

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pivotal role in promoting sustainability within the realm of IB in business and management schools; and (ii) not only addresses immediate environmental concerns and global complexities, but also fosters future leaders with a global shared mindset that values long-term sustainability and ethical decision-making.

The five categories (and key sub-categories) clearly describe the current state of knowledge on sustainability education in business and management schools, highlighting the importance of holistic approaches as a category that integrates university and student levels. This will be explained in more detail during the next section and depicted in Figure 3.

Insert Figure 3

Discussion and Future Research

In an era characterized by ongoing global environmental and social challenges, the incorporation of EfS into business schools is not merely an option but an imperative necessity. At macro, meso, and micro levels, findings of this study show that EfS still has a long way to go towards achieving an overall integration of sustainability in business higher education. Even though relevant steps were already made in this direction, most of these were based on keeping up with global trends rather than leading them. EfS has been developed as a response to globalisation needs, higher morality and ethical trends in business, the emergence of the SDGs, and the urgent claim for prioritising human dignity and social well-being over economic activities. IB education in turn has the potential of delivering a global scale impact through its business activities. EfS is also fighting the aftermath of an era where increasing

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profits was the most important goal for firms and where individualistic approaches were the
most accepted means to achieve it. Hence, there is a hope that business schools must embrace
a holistic approach to education (Spychalski, 2023), extending them beyond the classroom
and incorporating sustainability principles at both institutional and curricular levels. While
SDG framework presents a positive and inclusive approach integrating social, environmental,
and economic considerations within the field of IB (Sinkovics, Vieira, and van Tulder, 2022),
there are several critical IB perspectives within business schools that remain insufficiently
investigated. In this section we expand on this by addressing the three key points of this
paper, including implications for the future research with the aim of contributing to the
research and practice of sustainability education in business schools and IB.

The state of knowledge of sustainability education in business schools

At the university level, management and faculty in business schools are still embracing the
traditional mindset focused only on obtaining profits (Baden and Higgs, 2015). EfS is offering
the focus on the knowledge that emphasizes ethics and values-based decision making,
environmental issues awareness, social well-being, and sustainable development (AL-Mutairi,
2021; Annett, 2021). In addition, relevant critical perspectives in business teaching involve
the need for faculty to enhance the development of critical and ethical thinking in students
(Dyck, 2017), apply transdisciplinary perspectives (Reficco and Jaén, 2019), contextual,
organizational, curricular, and pedagogical tools (Alcadipani, 2017; Gimenez, 2021; Figueiró
et al., 2019), and find connections among business, sustainability and PRME (Borges, 2017).

Although new knowledge together with teaching techniques for EfS have been developing in
business schools, there is a strong necessity to decolonise management and organizational
knowledge (Allen, and Girei, 2023). EfS would conduct business education through

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sustainability integration using integrative frameworks such as global challenges (Figueró *et al.,* 2022; Gupta and Singhal, 2017), regional and cross-cultural perspectives (Joshi, 2018), and other HEIs' scopes (Gröschl and Gabaldon, 2018). Henceforth, the IB field would contribute to EfS by providing models to better understand the impacts of those global challenges and cross-cultural perspectives. These models would turn into proper labs for incorporating sustainability, having the opportunity to globally trace and understand the impact of IB activity. Nevertheless, efforts to integrate sustainability into business education may be drifting if HEIs' curricula keep a business-as-usual structure, undermining these integration attempts as well as reinforcing the traditional just-for-profit mindset of managerial staff (Baden and Higgs, 2015).

For example, the literature shows that prior efforts have included the integration of strategic sustainability-related topics such as migration phenomenon, disaster management, innovation processes, poverty, supply chains, gender education, and so on (Faludi and Gilbert*.,* 2019; Gimenez*.,* 2021). We also found that key perspectives, such as SDGs business knowledge, impact awareness, systems thinking, sense of social justice, futures thinking, and transformational learning, were incorporated into the business curricula to assist students in interpreting differently the business topics under discussion within the current curricula (Olalla *et al.,* 2019; Faludi and Gilbert*,* 2019). However, we did not find evidence of any structural change or dramatic disruption of traditional business curricula, but merely attempts to incorporate sustainability topics, revealing a hidden inertia towards business-as-usual perspectives. These findings support Dean, Gibbons, and Perkiss (2018), Thomas *et al.,* (2018), and others, regarding the gap that business schools need to fill between what they declare and what they actually do towards EfS.

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At the student level, our review has identified some studies focused on specific pedagogical

methods that would aim to close the aforementioned gap. However, there still seems to be a

lot of alternatives to these more traditional teaching methods such as teaching cases, business

simulation games, and exposition to moral philosophy (Prado and Arce, 2020; Grayson,

2016). In addition, other experiential methods need to be considered such as yoga-based and

religious practices, and real-time community-based projects (Dagar *et al.,* 2020; Dal Magro *et*

al., 2020), as well as the use of a virtual learning platforms (Woods, Dell, and Brigid, 2022).

The literature has emphasized stakeholders as key players to promote EfS, the holistic

integration of sustainability, lead curricula transformation processes, and develop innovative

pedagogical methods. The role of IB becomes key due to the structure of current global value

chains with stakeholders both nearby and abroad. Thus, developing trust among stakeholders,

establishing relationships with specific networks, implementing cross-sector partnerships,

making alliances with other business schools, getting closer to managers and practitioners,

and incorporating interdisciplinary approaches would increase the readiness for EfS in

business higher education (e.g., Delgado-Márquez *et al.,* 2016; Hauser and Ryan, 2021).

Consequently, commitment to sustainability at institutional and curricula levels with a holistic

approach, is paramount. Universities must recognize the importance of sustainable practices

not only in relation to the status quo of implementation and transformation (Cornuel and

Hommel, 2015), but also promoting university's faculty development and sustainable

partnerships.

Knowledge frontier issues in research on sustainability education in business schools

Although EfS in business and management is already in motion, it seems to be in a confused

stage, beginning an incipient development, without a clear strategy to date. Despite the strides

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scientific research has made, illustrated in the five categories, there remain pitfalls at the frontiers they have reached that hides important opportunities to achieve a comprehensive incorporation of sustainability into business schools' curricula.

Generating a paradigm shift from a traditional management and faculty's mindset is a serious challenge. In a general sense, without the proper attitude and strategic resources re-oriented towards EfS, there are important risks of business schools not being capable to produce any substantial change. There is a need to apply a holistic approach in education for sustainable development (Spychalski, 2023). Within our sample, clear evidence on the use of the SDGs in the curricula was a missed factor. As long as we are unable to integrate all sustainability concerns, it is impossible to talk about a holistic approach. However, more research is needed about how the SDG framework could be enhanced within the IB field to offer a positive and inclusive way forward to integrate social, environmental, and economic aspects (Sinkovics, Vieira, and van Tulder, 2022).

Business schools' curricula may unconsciously prefer the status quo, keeping the just-for-profit orientation and falling into an inertia in incorporating a sustainability perspective. Isolated research and practice efforts offer proof that more research is needed not only to fill these gaps but to propose integrative university-student strategies. Thus, emphasizing research on integrative systems through use of a holistic education approach combined with the implementation of educational innovation will shape an integration between university (shareholder, and shared-mindset change), and student (pedagogical methods and curricula) levels. Also, as stakeholders are considered as a key element for business education strategy on its way to EfS, (such as developing trust, alliances, practitioner-orientation, networks, and interdisciplinary methods to would push EfS forward), it will be important to study how these

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relationships may be maintained over time, and which stakeholders specifically would be

needed to support an overall incorporation strategy for sustainability in business education.

Foremost, the state of knowledge for sustainability education in business schools at macro,

meso and micro level, is being challenged by other IB critical perspectives represented in

recent research paradigms. For example, at macro level, research studies are questioning the

power of balances and knowledge hierarchies within business schools. At micro level, studies

argue that curriculum and pedagogy in Western business schools may suppress or reject

alternative or diverse knowledge(s) such as from women, minorities, or indigenous peoples

(Joy and Poonamallee, 2013; Woods, Dell, and Brigid, 2022). At the meso level, recent

studies analyse how a holistic decolonial approach (Jimenez, Vannini, and Cox, 2023) can

help to improve the university and student understanding of EfS in business schools, with a

strong emphasis on the IB field.

The role of business EfS to explore in future research

We argue that there is still a vast unexplored terrain regarding what else exists besides those

five categories found in the literature review as well as what opportunities await in the future

of business education. HEIs create, acquire, and transfer knowledge in complex ways

(Bratianu, 2011). However, following the results of our study, business schools are mostly

focused on acquiring and transferring knowledge about EfS, rather than creating it. A future

research avenue could be to test our framework (Figure 4). Holistic education learning

experiences in universities is a necessity as it empowers students to become well-rounded

individuals who are not only academically proficient but also emotionally intelligent, socially

aware, and ethically responsible. In this sense, IB education provides a comprehensive

training ground for students to identify, analyse, and implement global, multidisciplinary and

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cross cultural strategies. Besides incorporating new content and methods, business education

needs transformative decisions towards a comprehensive sustainability, which would involve

deep multi-cultural as well as cross-country analyses. In doing this, HEIs would establish

proper networks and increase their social capital to obtain valuable resources as well as good

opportunities to benchmark from the peer institutions (Whelan, Collings, and Donnellan*,

2010). For example, HEIs may shift their relationships with their stakeholders depending on

the contextual factors and the ongoing situation (Gonzalez-Perez *et al*. 2021). Therefore,

business schools would have a key role in developing academic research focused on their

stakeholders' characteristics, potential to form alliances, internationalization strategies, and

current and future expectations. Likewise, future studies on the shared-mindset change

category are needed (Phillips, 1994). Specifically, research should analyse managers' mental

models for strategic decision-making in relation to the integration of SDGs in business

schools. Additionally, the strategic interrelation between mindsets at macro and micro levels

should be examined to understand how fostering a sustainable mindset in higher education,

particularly within business schools, can be achieved. Working together with them would

mean better opportunities to achieve an integrative sustainability perspective.

In relation to pedagogical approaches, there is a lack of overarching models and theories in

the field impeding the ability of business schools to drastically rethink their approach to

teaching business. While incorporating sustainability topics into the existing programs of our

business schools is a welcome first step, more integrated approach to business school

curricula is in order. This next step is associated with pedagogical approaches that focus on

the development of students' skills and capabilities often overlooked by traditional business

education, such as systems thinking, social justice, and moral philosophy. Unlike traditional

business school pedagogy approaches, such as classroom teaching through textbook material

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supplemented by teaching cases and business simulations, more experiential and

transformational learning approaches are in order. These learning approaches are based on

active engagement of students with the subject matter through projects involving internal and

external stakeholders, such as student and on-campus organizations, as well as communities

and companies that are willing to engage with students. In relation to curriculum, more

research needs to be done to explore the interconnectivity between shared-mindset change and

curriculum categories. For example, based on a case study, Lyons (2012) suggests ten micro-

curriculum capabilities for a successful MBA program. However, there is a lack of research

on the specific capabilities that management and faculty members need to develop a

sustainable curriculum that equips students with the appropriate sustainable knowledge and

skills.

In brief, recognising that sustainability education in business schools is of paramount

importance in today's world, where global complexities and rapid changes and

transformations are the new norm, is not enough. The applicability of strategic holistic

approaches to sustainability education goes beyond traditional IB practices and equip future

global leaders with a comprehensive understanding of the interconnectedness between

business, society, and the environment. However, while global changes and transformation

are moving faster than ever, the applicability of a holistic education approach is still in early

stage of development in business and management schools, with a subsequent failure to

prepare these needed global business leaders. Considering findings of this research and

emerging critical IB perspectives, calls for more IB studies on decolonising universities are

needed (Boussebaa, 2023). As a driver for the SDG (Haley, 2023), these future decolonisation

studies will equip future leaders with an in depth understanding on current sustainable global

issues affecting multinationals from a different perspective, and how to respond effectively

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considering history, culture, and context (emerging-advanced economies) (Alcadipani, 2017; Boussebaa, 2023). Future studies on a holistic decolonial framework (Joy and Poonamallee, 2013; Woods, Dell, and Brigid, 2022) may contribute to efforts when implementing EfS in business schools.

Contributions

This study highlights the development of EfS in business education research from 2015 to 2022. Our results show the concentration of research in five categories at macro, meso, and micro levels that we have identified based on our analysis. These findings contribute to the EfS in business and management fields, but particularly to the critical IB perspectives. By integrating sustainability into business curricula, HEIs help students gain the knowledge and skills needed to navigate the intricate global challenges of our time, including climate change, social inequalities, and resource depletion. As global businesses play a pivotal role in shaping our world, it is crucial that business and management schools nurture leaders who are not only profit-driven but also socially and environmentally responsible, ensuring a brighter and more sustainable future for all. To this end, it is imperative that the decision-makers at university and student levels consider critical and contemporary IB aspects for a better understanding and implementation of EfS. Those aspects may include the need for decolonising IB and management education, more research on IB in each SDG category, indigenising pedagogy, and circulation of management education and EfS globally. These aspects should be analysed under a holistic decolonial lens.

Business schools can contribute through the development of IB topics in research on incorporation of a comprehensive EfS with a holistic approach. How EfS academic research in business education has moved forward is summarized in Figure 3, which lead us to propose

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a framework depicted in Figure 4. Figure 3 shows the state of knowledge for EfS as an initial

stage, that was framed by our literature review process, and then how the analysis of the

current state led us to identify knowledge frontier issues in this research field (Figure 4). After

that, according to these issues we propose key roles for the future of EfS research in business

education.

Insert Figure 4

Following the five categories (in macro, meso, and micro levels) proposed by this research,

we contribute to the literature of EfS by shedding light on the evolution of the organizational

field as well as developing the current state of what have been done.

Conclusions

Our systematic review of the literature on EfS identified substantial interest in the topic from

the institutions of business education from around the world. The implication is that business

schools should (i) devote more resources to the integration of sustainability education through

holistic approaches, combining institutional and curricular changes as well as content from

other disciplines; (ii) create policies to reinforce the applicability of this integration; as well as

(iii) create a stakeholder engagement between schools, government, and private organisations.

More importantly, business schools need to better understand critical and contemporary IB

aspects for a effective implementation of EfS. Committing to sustainability in business

schools at the institutional level, by promoting university's faculty development, establishing

sustainable partnerships with government and private enterprises, would allow higher

education institutions to set stronger sustainable education foundations. Specific implications

for IB education could be related to how interdisciplinary IB curriculum could be designed as

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well as how both levels, university and students could synergistically collaborate with each other to enhance an IB program. Having an adequate long run curriculum strategy of IB programs would be instrumental to achieve this. In addition, the review of the literature suggests that by actively infusing sustainability into core courses, business schools could create graduates equipped with the knowledge, skills, and values needed to drive sustainable business practices globally. Holistic and interdisciplinary education play pivotal roles in advancing sustainability within business schools, nurturing responsible global leaders who will contribute to a more sustainable future.

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Sustainability in business education:

A systematic review and future research agenda

Figures and Tables

Figures (3 and 4):

Figure 3. Categories and sub-categories: knowledge for Education for Sustainability in Business
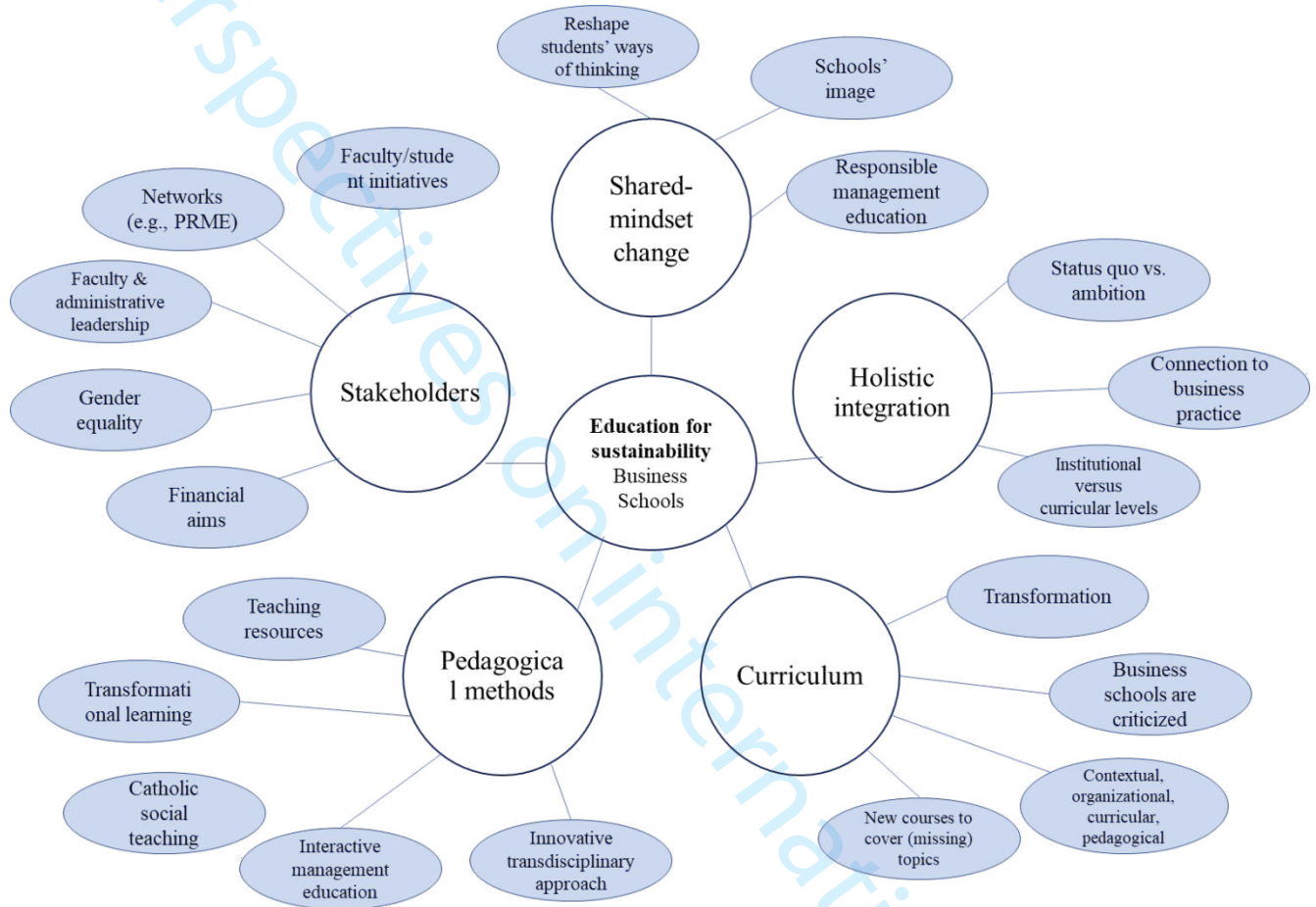
Schools

Figure 4. The state of knowledge for Education for sustainability in Business Schools, knowledge

frontier issues and the role of Education for sustainability for High education

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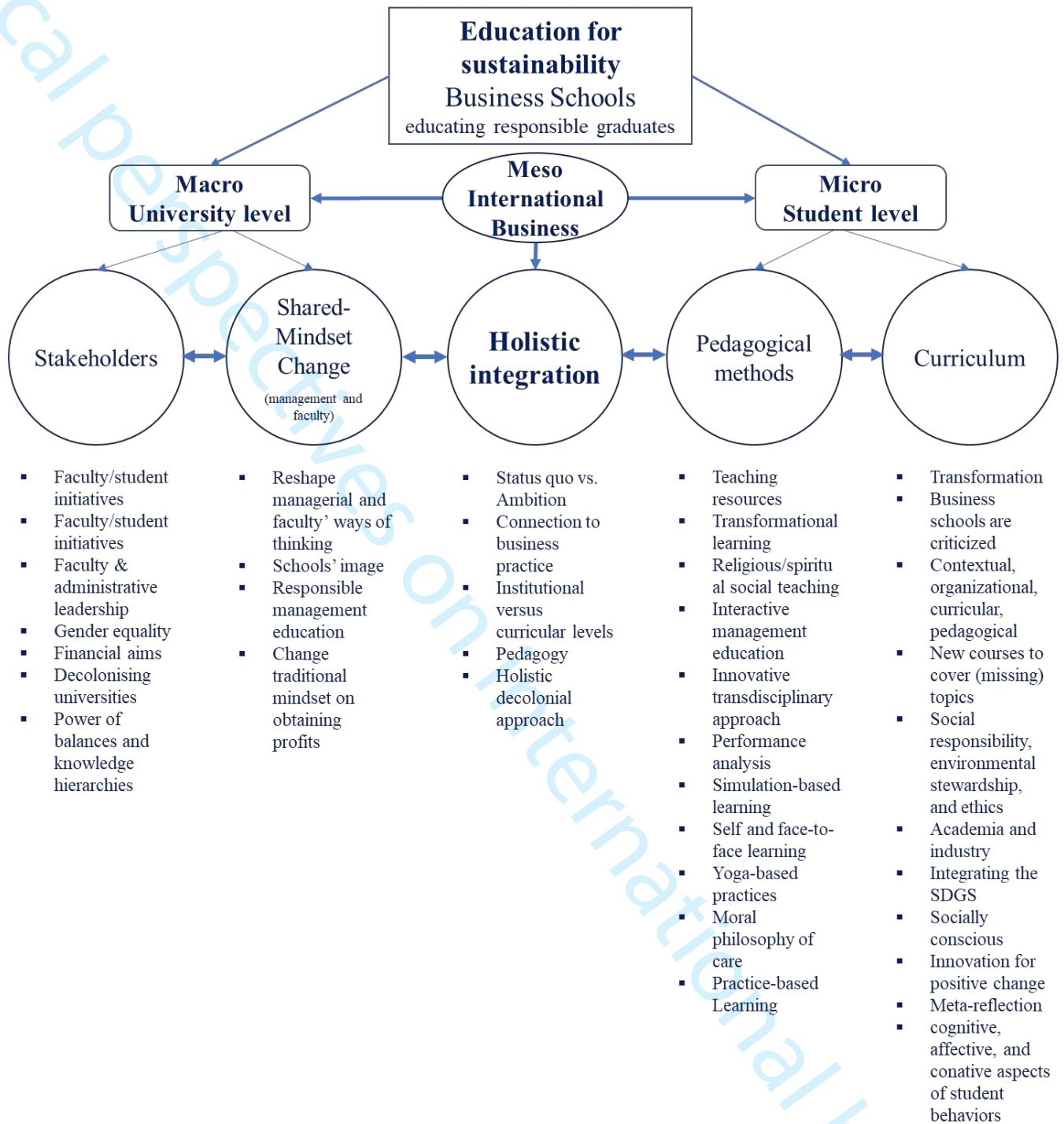
Appendix

Figure 1. Number of publications per year
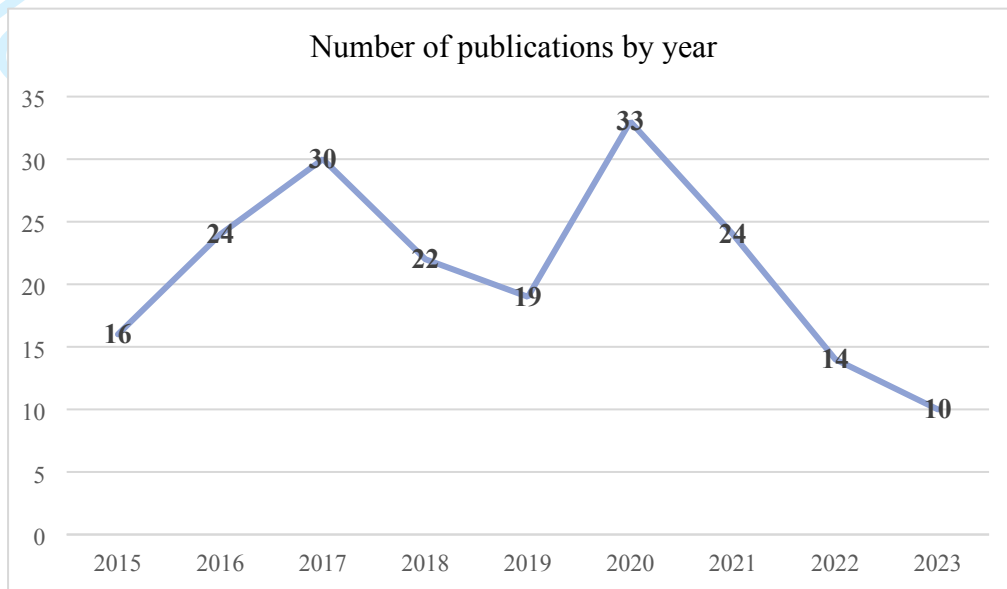
Number of publications by year

Year	Publications
2015	16
2016	24
2017	30
2018	22
2019	19
2020	33
2021	24
2022	14
2023	10

3

Figure 2. Distribution of studies across geographical regions
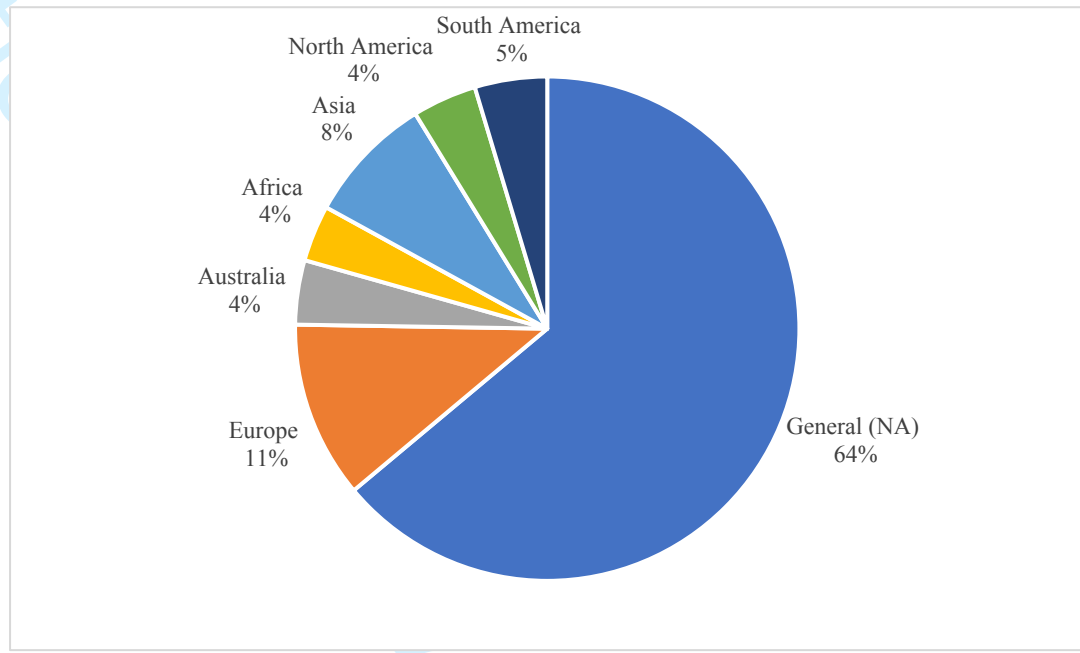
Source: Own depiction based on the final selection of articles used in the literature review; Papers categorized into the section general (NA) did not refer to any specific country context in their title or abstract.

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Table 1: Journals and rankings

|	Journal name	Number of articles	Ranking
1	3D: IBA Journal of Management & Leadership	1	NA
2	Academy of Business Research Journal	1	NA
3	Academy of Management Learning and Education	7	4*
4	Accounting, Auditing and Accountability Journal	1	3
5	Adhyayan: A Journal of Management Sciences	1	NA
6	Ad-minister	6	NA
7	Administração: Ensino e Pesquisa	1	NA
8	Administrative Sciences	2	NA
9	Advances in Business-Related Scientific Research Journal	1	NA
10	Africa Journal of Management	1	2
11	AI Practitioner	3	NA
12	American Journal of Business	1	1
13	American Journal of Management	1	NA
14	Brazilian Business Review (English Edition)	1	NA
15	British Journal of Management	1	4
16	Business & Professional Ethics Journal	1	1
17	Business and Society	1	3
18	Business & Society Review	1	NA
19	Business Education Innovation Journal	3	NA
20	Business Horizons	1	2
21	Business Management Dynamics	1	NA
22	Corporate Social Responsibility and Environmental Management	1	1
23	Entrepreneurship Theory and Practice	1	4
24	Environment, Development & Sustainability	1	NA
25	Ephemera: Theory & Politics in Organization	1	NA
26	European Management Review	1	3
27	Financial & Credit Activity: Problems of Theory & Practice	1	NA
28	Global Virtue Ethics Review	1	NA
29	Industrial Marketing Management	1	3
30	International Coaching Psychology Review	1	NA
31	International Journal of Business & Society	1	NA
32	International Journal of Management Education	43	1
33	International Journal of Project Management	1	2
34	International Journal of Manpower	1	2
35	IUP Journal of Brand Management	1	NA
36	Journal of Business & Educational Leadership	2	NA
37	Journal of Business Economics and Management	1	2
38	Journal of Business Ethics	14	3
39	Journal of Business Research	2	3
40	Journal of Business Strategy	1	1
41	Journal of Cleaner Production	7	2
42	Journal of Corporate Citizenship	1	1
43	Journal of Education for Business	5	NA

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	Journal name	Number of articles	Ranking
44	Journal of Environmental Economics and Management	1	3
45	Journal of Jesuit Business Education	6	NA
46	Journal of Management Development	11	1
47	Journal of Management Education	13	2
48	Journal of Management Information & Decision Sciences	1	NA
49	Journal of Management Inquiry	2	3
50	Journal of Management Studies (John Wiley & Sons, Inc.)	1	4
51	Journal of Research Administration	1	NA
52	Journal of Research in Business Education	1	NA
53	Journal of Services Marketing	1	2
54	Journal of Teaching in International Business	1	NA
55	Journal of Technology Management & Innovation	1	NA
56	Management Learning	6	3
57	Management: Journal of Sustainable Business & Management Solutions in Emerging Economies	1	NA
58	Organization & Environment	1	3
59	Polish Journal of Management Studies	1	NA
60	Proceedings of the Northeast Business & Economics Association	1	NA
61	Proceedings of the International Conference on Business Excellence	1	NA
62	Productivity	1	NA
63	SEISENSE Business Review	1	NA
64	Small Enterprise Research	1	1
65	Social Business	5	1
66	South Asian Journal of Business & Management Cases	1	1
67	Sustainability Accounting, Management and Policy Journal	3	2
68	Vision	3	1
		192	

Note: Rankings are based on the Academic Journal Guide 2021

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Table 2: Key thematic patterns and frequency

Categories	Frequency	Percentage
Shared-mindset change		
Values	30	17.24
Skills and competences	27	15.52
Stakeholders		
Other networks (PRME etc)	42	24.14
Practitioners	20	11.49
HEI general	53	30.46
Students	66	37.93
Faculty	45	25.86
Pedagogical methods		
General	9	5.17
Study trip	1	0.57
Mindfulness practices	2	1.15
Games	1	0.57
Projects	4	2.3
Scenarios	1	0.57
Role play and simulation	3	1.72
Case	5	2.87
Usage and design of tools	12	6.9
Curriculum		
Curriculum integration	30	17.24
Course topics	32	18.39
Inter- and transdisciplinarity	7	4.02
Best practices	8	4.6
Holistic integration		
Influence factors	5	2.87
SDGs	29	16.67
Status quo/limitations	29	16.67
Challenges, barriers and solutions	23	13.22

Source: Own depiction based on the final selection of articles used in the literature review; Thematic patterns printed in bold highlight the main coding categories

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Table 3 – Description of research themes

Categories	Description	Examples
Stakeholders (internal/ external)	Internal and external stakeholders at the university level reflect some of the following core groups, e.g., networks such as PRME, practitioners, students, and faculty.	"An experiential learning activity is introduced that was developed in partnership with the Principles of Responsible Management Education (PRME) network, and WikiRate, an online CSR reporting platform, employing the SDGs as a framework." (Dean et al., 2018, p. 387)
Shared-mindset change	Mindset change reflects the transformation in values and ideologies used/shared as part of business and management education, at university level, as well as the discussion around new skills and competencies as a consequence of this discussion.	"The essay describes how teaching two approaches to management increases students' critical and ethical thinking, and reverses the tendency for business students to become increasingly materialistic and individualistic." (Dyck, 2017, p. 1) "The ''Giving Voice to Values'' (GVV) pedagogy aims to enable students to act on their tacit values and address the rationalizations that they may encounter for not acting on these values." (Painter-Morland and Slegers, 2018, p. 807)
Pedagogical methods	Pedagogical methods reflect the different approaches highlighted, e.g., at the student level, cases, role play and simulation, projects, games, mindfulness practices, and other means of usage and tool design.	"We found that both pedagogical methods are effective for teaching this concept, although our results support the idea that simulations are slightly more effective than case studies, particularly to teach its multidimensional and inter-temporal nature." (Prado et al., 2019, p. 1)
Curriculum development	At the student level, curriculum development addresses to what extent sustainability has been integrated, which approaches have been taken, best practices, and which new course topics have been introduced.	"Seeking to close the gap, the opportunities of how to implement ESD into universities' curricula and syllabi are arranged to a comprehensive system covering all possible options: the so-called "morphological box for ESD"." (Isenmann et al., 2020, p. 1)
Holistic integration	Holistic integration reflects the extent to which sustainability is being used as an integrated approach across the school at the university and student levels. It also incorporates the frameworks, influence factors, limitations, and challenges regarding integration efforts.	"Despite major changes in the environment, the business models of business schools have not experienced much change. Methods of teaching and research remain similar to 30 years ago." (Trkman, 2019, p. 1) "holistic assessments that can more accurately depict the state of Responsible Management Education" (Tahmassebi and Najmi, 2023, p. 1)

Source: Own depiction based on selected paper

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Table 4: Code relations matrix

Codesystem/Categories	Values	Skills and competences	Other networks (PRME etc)	Practitioners	HEI general	Students	Faculty	Pedagogical methods (general)	Study trip	Mindfulness practices	Games	Projects	Scenarios	Role play and simulation	Case	Usage and design of tools	Curriculum integration	Course topics	Inter- and transdisciplinarity	Best practices	Influence factors	SDGs	Status quo/limitations	Challenges, barriers and solutions	SUM
Shared-mindset change																									
Values	0	2	2	1	1	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	16
Skills and competences	2	0	0	1	0	9	0	0	0	0	0	0	0	1	0	0	2	2	0	0	0	0	0	0	17
Stakeholders																									
Other networks (PRME etc)	2	0	0	2	1	3	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	6	1	0	17
Practitioners	1	1	2	0	2	1	5	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	16
HEI general	1	0	1	2	0	4	1	1	0	0	1	0	0	0	0	0	1	3	0	0	0	2	6	2	25
Students	5	9	3	1	4	0	9	0	0	0	0	1	0	0	1	1	5	4	0	0	0	2	2	1	48
Faculty	1	0	1	5	1	9	0	0	0	0	0	0	0	0	0	0	4	3	1	0	0	1	0	2	28
Pedagogical methods																									
General	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
Study trip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mindfulness practices	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Games	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Projects	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Scenarios	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Role play and simulation	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2

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critical perspectives on international business

Case	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Usage and design of tools	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4
Curriculum																									
Curriculum integration	0	2	0	1	1	5	4	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6	0	22
Course topics	0	0	1	0	3	4	3	0	0	0	1	0	0	0	0	0	1	0	0	0	0	2	0	0	15
Inter- and transdisciplinarity	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Best practices	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Holistic integration																									
Influence factors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SDGs	1	0	6	0	2	2	1	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	2	0	17
Status quo/limitations	1	0	1	0	6	2	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	2	0	4	22
Challenges, barriers and solutions	1	0	0	1	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	11
SUM	16	17	17	16	25	48	28	4	0	0	2	1	0	2	2	4	22	15	2	1	0	17	22	11	272

Source: Own depiction based on the thematic patterns of the final selection of articles used in the literature review

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