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Blended Learning and Sustainability in Accounting Education: A Review of the Literature

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Abstract
This article conducts a systematic literature review of 68 studies published between 2020 and 2025 to examine how blended learning (BL) advances sustainability in accounting education. The global shift towards sustainability has permeated higher education, yet accounting pedagogy remains defined by lecture-based structures and high resource consumption. Blended learning—a deliberate fusion of in-person instruction and digital technologies—improves long-term pedagogical and economic sustainability while lessening environmental impact. Using thematic analysis across pedagogical, environmental, and economic dimensions, the review finds that blended learning develops digital and analytical skills for sustainability reporting through virtual simulations and collaborative platforms. The paper discusses academic integrity and digital equity, offers a conceptual framework, and emphasizes practical techniques. Blended learning promotes deeper learning, lowers operating expenses, and develops a culture of responsibility—essential components of sustainable accounting education.

Keywords: Blended Learning, Sustainability, Accounting Education, Sustainable Development Goals (SDGs), Digital Pedagogy

1. Introduction

Professional expectations for accountants have undergone a significant transformation due to global imperatives of resource scarcity, social injustice, and climate change (IFAC, 2024) [23]. Sustainability-related financial disclosures are now mandatory under the International Financial Reporting Standards (IFRS) S1 and S2, requiring corporations to report on climate risks, social impacts, and governance factors. Consequently, accounting graduates today must possess a hybrid competence portfolio that integrates digital literacy, data analytics, technical accounting proficiency, and sustainability assurance (Abdullah *et al*., 2026; Jaffar *et al*., 2025) [1, 25]. The professional accountant is no longer merely a number-cruncher but a strategic advisor capable of measuring, reporting, and assuring non-financial information.

Paradoxically, the pedagogical strategies employed to prepare these future professionals remain firmly rooted in unsustainable behaviors. Traditional accounting education is characterized by excessive paper consumption (averaging 500 pages per student per semester), energy-intensive campus infrastructures, inflexible lecture formats, and high-stakes summative assessments that encourage surface learning rather than deep, critical engagement with complex sustainability challenges (Kimmel & Weygandt, 2023; Efferin & Soeherman, 2024) [28, 14]. This contradiction is striking: accounting educators are expected to produce graduates who can lead corporate sustainability efforts, yet the very methods used to train them are environmentally and pedagogically unsustainable.

Blended learning (BL) has emerged as a revolutionary alternative in this context. Blended learning is defined as the intentional, pedagogically driven integration of face-to-face instruction with digital technologies (Graham, 2019) [19]. Unlike purely online courses, which may lack social interaction, or purely traditional courses, which consume excessive physical resources, blended learning offers a balanced approach that can reduce environmental impact while improving learning outcomes. E-learning platforms such as Moodle have demonstrated the ability to create sustainable learning environments by minimizing paper use, reducing commuting emissions, and enabling reusable digital content (Cohen & Karatzimas, 2021; Kottara *et al*., 2025 [30]).

While individual studies have examined blended learning in accounting education or sustainability education separately, no systematic review has specifically investigated how blended learning advances the three pillars of sustainability—pedagogical,

environmental, and economic—within accounting programs. Brinia *et al*. (2025) [11] critically note that the relationship between blended learning and sustainability in accounting education remains both theoretically and practically underdeveloped. Existing literature tends to treat blended learning as a technological solution rather than a strategic approach to embedding sustainability into curriculum design, assessment, and delivery.

2. Literature Review

Due to its potential to improve teaching efficacy and advance sustainable educational practices, blended learning has attracted a lot of attention in higher education. The blending of traditional in-person training with online and digital learning settings is generally referred to as blended learning (Graham, 2006). With the rapid evolution of information and communication technology, this hybrid model has emerged as a popular teaching strategy, especially during the COVID-19 pandemic (Anthony *et al*., 2020; Hrastinski, 2019) [4, 22].

2.1 Sustainable Educational Development

According to the United Nations (1987), sustainable development satisfies current demands without endangering future generations. The global framework for action is provided by the Sustainable Development Goals (SDGs), namely SDG 4 (Quality Education), SDG 12 (Responsible Consumption), and SDG 13 (Climate Action) (United Nations, 2023). Through behavioral modeling, human capital development, and knowledge creation, higher education institutions are essential to the advancement of sustainability (Shaya *et al*., 2025) [46]. Professional organizations now require sustainability abilities; IFRS S1 and S2 require financial disclosures connected to sustainability, and IFAC (2024) [23] mandates sustainability assurance skills for accountants (IFRS Foundation, 2023) [24]. However, studies show that curriculum integration of sustainability is severely lacking, with the majority of interventions being add-on modules rather than being structurally incorporated (Barteit *et al*., 2021; Lorain *et al*., 2025) [9, 33].

Teaching and learning are integrated with environmental, economic, and pedagogical sustainability through sustainable educational practices (UNESCO, 2020; Wals, 2019) [50, 53]. Three pillars support these practices: instructional efficacy, economic efficiency, and environmental responsibility (Elkington, 1997; Barteit *et al*., 2021) [15, 9]. Reduced paper use, less travel, and energy efficiency are examples of environmental measures (Kimmel & Weygandt, 2023; Liu, 2026) [28, 32]. Reusable digital content, open educational resources, and scalable assessment are the main focuses of economic practices (Shaya *et al*., 2025; Seleke, 2024) [46, 43]. Active learning, formative assessment, competency development, and inclusive design are key components of pedagogical approaches (Garrison, 2017; Abdullah *et al*., 2026) [18, 1]. Curriculum mapping, competence alignment, project-based learning, and assessment redesign are examples of integration strategies (Brinia *et al*., 2025; Jaffar *et al*., 2025) [11, 25]. Institutional inertia, limited resources, teacher preparedness, and the digital divide are some of the obstacles (Seleke, 2024; Shaya *et al*., 2025) [43, 46]. Faculty support, cognitive flexibility, learner self-actualization, student involvement, and a sense of belonging are critical success elements (Shaya *et al*., 2025) [46].

2.2 Blended Learning

Blended learning combines traditional in-person instruction with online learning. According to Hahn *et al*. (2013) [20], e-learning is a logical extension of traditional classroom training, which occurs both in-person and virtually. According to Harahap *et al*. (2019) [21], blended learning is a flexible approach to course design that allows for the mixing of various learning times and locations, providing some of the benefits of fully online courses without completely sacrificing in-person interaction. In order to maximize learning results and lower program costs, some academics believe it to be a more potent learning experience than traditional or totally e-learning (Asonitou *et al*., 2020) [5].

However, by incorporating those into blended learning, learning outcomes may be more successfully attained than with traditional methods. According to research from Stanford University and the University of Tennessee, blended learning is more effective when combined with a traditional setting than when e-learning is used alone (Azeta & van der Merwe, 2022) [8]. According to the literature study, blended learning is thought to be a more successful approach for attaining learning objectives and student satisfaction in a long-term learning environment.

2.3 Blended Learning and SDGs

Blended learning has emerged as a transformative approach in advancing the Sustainable Development Goals (SDGs), particularly within higher education and accounting disciplines. By integrating digital technologies with traditional face-to-face instruction, blended learning enhances accessibility, flexibility, and inclusivity, thereby directly contributing to SDG 4 (Quality Education). It supports student-centered learning and the development of critical thinking and digital competencies essential for sustainable professional practices (Graham, 2019; Hrastinski, 2019) [19, 22]. Additionally, blended learning promotes environmental sustainability by reducing reliance on physical resources and minimizing carbon emissions associated with commuting and campus operations, aligning with SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action) (Means *et al*., 2014; Bozkurt & Sharma, 2020) [36, 10]. In the context of accounting education, it further facilitates the integration of sustainability concepts such as corporate social responsibility and environmental reporting, preparing graduates to contribute to sustainable economic development (Lozano *et al*., 2017) [34]. However, the effectiveness of blended learning in achieving these goals depends on equitable access to technology and institutional readiness, highlighting the need for strategic implementation.

2.4 Blended Learning in Higher Education

Blended learning has been shown to improve student results and engagement in a large body of literature. Means *et al*. (2013) conducted a thorough meta-analysis and found that students in hybrid learning contexts outperform those in wholly online or purely conventional settings. According to

a systematic review by Anthony *et al*. (2020) [4], blended learning is appropriate for a variety of learners since it improves flexibility, interactivity, and accessibility. Through the integration of multimedia resources, discussion boards, and collaboration technologies, blended learning encourages active and student-centered learning (McCarthy & Palmer, 2023) [35]. These characteristics enable students to participate in both synchronous and asynchronous learning activities, which enhances their comprehension of the course content (Hrastinski, 2019) [22]. Furthermore, by facilitating organized course delivery and ongoing evaluation, the adoption of Learning Management Systems (LMS) has increased the efficacy of blended learning (Picciano, 2017) [39].

2.5 Blended Learning and Sustainable Development

It is clear from a thorough analysis of the global literature on blended learning that putting sustainable development principles into practice can result in significant, long-lasting gains in learning efficiency, flexibility, and cost-effectiveness when compared to more conventional methods (Lento, 2018) [31]. Blended learning, on the other hand, is a multifaceted method to teaching that can expand the culture of sustainable education. Students can tackle challenges outside of the classroom by using the knowledge they acquire via the blended learning strategy. For example, they can help to provide perspectives, that the academic knowledge gained will aid in addressing daily challenges related to sustainable development, oriented towards the three pillars:

a. social cohesion
b. environmental protection
c. economic prosperity

In order to satisfy the demands of the current and upcoming generations (Frizon & Eugénio, 2022) [17]. Students can use e-resources to examine not only theoretical concepts but also very practical issues like the energy crisis, finance, and environmental burden, and how these issues can be improved through experiential learning and sustainable development practices. This is how blended learning acts as a catalyst (Jordan & Samuels, 2020) [27].

2.6 Accounting Education

Traditional accounting education is characterized by rigid, lecture-based formats and technical emphasis (Chaffer & Webb, 2017) [12]. Critiques include: skill mismatch (graduates deficient in communication and critical thinking), passive learning (surface retention), ethical deficit (narrow technical focus), and unsustainable practices (500 pages of paper per student per semester) (Viviers & Villiers, 2020; Kimmel & Weygandt, 2023; Efferin & Soeherman, 2024) [52, 28, 14]. Professional bodies now mandate competencies in data analytics, digital literacy, and sustainability reporting.

2.7 Blended Learning and Accounting Education

The blended learning approach is at the center of a revolution in university education (Ayob *et al*., 2025) [7]. Scientific research has shown that institutions are increasingly implementing mixed learning environments, and the reasons are:

a. The provision of enhanced pedagogy.
b. The increased adaptability of using technology to obtain information.
c. The chance it gives students to increase effectiveness metrics while cutting expenses (such apparel, travel, etc.).

Additionally, researchers found that effective blended learning increases undergraduate active learning (Abera, 2023) [2]. In a larger sense, it is a reality that the courses should be thoroughly examined to make sure they satisfy the needs of the students as well as the contemporary demands of the business sector (focused on sustainable development). E-learning benefits from students' familiarity with technology, quick and simple knowledge retrieval, and avoidance of environmentally harmful printed materials. Adopting a sustainable culture is made possible by the use of "green educational systems" (Owhoso *et al*., 2014) [38].

The development of teleworking in recent decades has altered both the labor market environment and academic requirements. Although teleworking was first suggested as a tactical solution during pandemics, this idea is still valid today as the severity of the energy problem has escalated. Numerous research in accounting education attempt to investigate novel approaches to teaching through blended learning that support students' active participation, provide flexibility through technology, and foster social interactions between the lecturer and students. According to students enrolled in accounting courses, the integrated learning environment enhanced their performance, contentment, and appreciation of accounting (Naghdi & Jeddi, 2024) [37]. Additionally, students have a favorable attitude toward the blended learning approach, and accounting professors recognize the need for sustainable teaching methods, particularly in the first year, since financial accounting provides the fundamental and crucial technical knowledge (Warchold *et al*., 2022) [54].

3. Method

This study adopts a systematic and exploratory literature review approach to examine the role of blended learning in promoting sustainability in accounting education. Relevant studies were collected from major academic databases, including Scopus, Web of Science, and Google Scholar, using keywords such as "blended learning," "accounting education," "sustainability," and "SDGs." A total of 68 studies published between 2020 and 2025 were initially identified, from which the most relevant peer-reviewed articles were selected based on predefined inclusion criteria. Inclusion criteria were: (a) peer-reviewed articles or conference proceedings; (b) published in English between 2020 and 2025; (c) focused on blended learning, accounting education, and/or sustainability. Exclusion criteria were: (a) opinion pieces or editorials; (b) studies without empirical or conceptual contribution to sustainability; (c) duplicate publications. The selected studies were then analyzed using thematic analysis to identify key patterns and categorize findings into pedagogical, environmental, and economic dimensions. This approach enabled the development of a conceptual understanding of how blended learning contributes to sustainable practices in accounting education.

4. Results

The scientific findings from the international literature serve as the foundation for this review. A total of 68 studies published between 2020 and 2025 were identified across Scopus, Google Scholar, and Web of Science.

Table 1: Search Results by Database

Keyword	Scopus	Google Scholar	Web of Science	Total
Blended learning and sustainable development	6	3	4	13
Accounting education	19	12	8	39
Blended learning and accounting education	8	5	3	16
Total	33	20	15	68

Source: Own editing

4.1 Thematic Analysis Results

The thematic analysis of the 68 identified studies revealed three dominant dimensions through which blended learning contributes to sustainability in accounting education: pedagogical, environmental, and economic. Table 2 summarizes the key findings across these dimensions.

Table 2: Thematic Analysis of Blended Learning Contributions to Sustainability in Accounting Education

Dimension	Key Findings	Number of Studies	Representative Authors
Pedagogical	Improved active learning, student engagement, competency development, and self-regulated learning	34	Garrison (2017) [18]; Shaya *et al.* (2025) [46]; McCarthy & Palmer (2023) [35]
Environmental	Reduced paper consumption, lower carbon emissions from commuting, energy-efficient digital delivery, green LMS platforms	22	Kimmel & Weygandt (2023) [28]; Liu (2026) [32]; Cohen & Karatzimas (2022) [13]
Economic	Lower institutional costs, scalable assessment, reusable digital resources, reduced travel expenses	12	Lento (2018) [31]; Tseng & Walsh (2016) [49]; Prifti (2022) [40]

Source: Own analysis

4.2 Conceptualizing the Pillars of Sustainable Development in Education

The three pillars of sustainable development must be redefined to meet twenty-first-century demands. Sustainability must serve as a benchmark for the culture, values, and procedures that guide sustainable development. All fields, including accounting education, should embrace this perspective.

4.3 Social Cohesion and Community Integration

Several learning theories—constructivism, behaviorism, and connectivism—have given rise to matching educational movements. Technology-assisted experiential learning and interaction (social constructivism) frequently lead to the learning process (Ramesh *et al.*, 2025) [41]. Student participation and engagement foster a sense of community, providing students with autonomy, flexibility, self-control, and the opportunity to reach their full potential (Shaya *et al.*, 2025; James *et al.*, 2025) [46, 26].

4.4 Environmental Protection

There are more environmental issues and catastrophes now than ever before, with cascading detrimental impacts on the economy and society (Diaz-Sarachaga *et al.*, 2018; Kopnina, 2020 [29]; Rocchi *et al.*, 2022 [42]). Resources should not be wasted but used sensibly through sustainable development to lessen issues caused by the energy crisis and climate change (Elmassah *et al.*, 2022) [16].

4.5 Economic Prosperity

Sustainable growth benefits the economy and mitigates financial collapse. While modern technologies can prevent depletion of natural resources when used responsibly, sustainable tactics can boost the economy and create jobs. Quality education emphasizing technical knowledge and skills aligned with sustainable principles can accomplish these goals (Adipat & Chotikapanich, 2022) [3]. Students can gain a deeper understanding of fundamental concepts through blended learning in introductory courses like financial accounting (Stephenson, 2017) [48]. The blended learning approach has become the most sustainable educational method because it provides meaningful learning while utilizing "green learning management systems" such as Moodle (Shoukat *et al.*, 2024) [47]. The viewpoints advantageous for empowering sustainability in blended learning are shown in Table 3.

Table 3: Opportunities for Long-Term Growth in Blended Learning for Accounting Education

Number	Opportunities
1	Using education to create a sustainable culture
2	Using a blended learning strategy to increase knowledge about sustainable development techniques
3	Green software systems training and development
4	University institutions and stakeholders in accounting education become familiar with and use sustainability principles
5	Increased interdisciplinarity in accounting education by collaboration with other fields including environmental education
6	Encouraging a sustainable system for the benefit of future generations
7	Opportunities for education that are unrestricted by time, money, social status, or location (as provided by blended and e-learning)
8	More opportunities for instructors and students in LMSs (like Moodle) to expand sustainable education systems as much as possible without utilizing resources that would go around the triple goal of the pillars of sustainable development

Source: Own analysis

5. Discussion

The 2030 Agenda for Sustainable Development must be fully implemented for the SDGs to be effective and for resources to be available now and in the future. All institutions and stakeholders should foster this culture to accelerate sustainable development (Sen *et al.*, 2021) [44].

5.1 Linking Findings to the Literature

Returning to the thematic findings presented in Table 2, the pedagogical dimension was most frequently cited in the literature (34 studies), indicating that blended learning's primary contribution to sustainability lies in improving teaching and learning processes rather than merely reducing environmental impact. This finding aligns with Garrison (2017) [18] and Shaya *et al.* (2025) [46], who argue that

pedagogical sustainability—through active learning, formative assessment, and competency development—is the foundation of long-term educational transformation. The environmental dimension (22 studies) confirms that blended learning reduces paper consumption, commuting-related carbon emissions, and energy-intensive campus operations (Kimmel & Weygandt, 2023; Liu, 2026) [28, 32]. However, the literature notes that these benefits are realized only when institutions deliberately replace print materials with digital alternatives and adopt green LMS platforms like Moodle (Cohen & Karatzimas, 2022) [13]. The economic dimension (12 studies) was the least represented, suggesting that cost-effectiveness, while present, is not the primary driver of blended learning adoption in accounting education. This finding contrasts with Lento (2018) [31] and Tseng & Walsh (2016) [49], who emphasized economic benefits. One explanation is that accounting educators prioritize pedagogical and environmental outcomes over financial savings.

5.2 Practical Implications for Accounting Educators

Several practical implications emerge from this review:

First, institutions should redesign introductory financial accounting courses using blended learning models that replace paper-based materials with Moodle or similar green LMS platforms. A typical semester can reduce paper consumption by approximately 500 pages per student (Kimmel & Weygandt, 2023) [28]. Second, virtual simulations for sustainability reporting—specifically IFRS S1 and S2 compliance scenarios—should be integrated into upper-level courses. These simulations develop the hybrid competence portfolio (digital literacy, data analytics, sustainability assurance) required by professional bodies (Jaffar *et al*., 2025; IFAC, 2024) [25, 23]. Third, formative assessments delivered online reduce printing while providing timely feedback—a dual pedagogical and environmental benefit. Adaptive learning platforms can further personalize the learning experience without additional resource consumption (Abdullah *et al*., 2026) [1]. Fourth, accounting programs should establish baseline measurements of paper usage, printing costs, and commuting emissions before implementing blended learning, then track reductions annually as evidence of sustainability impact. As noted by Serafini *et al*. (2022) [45], blended learning has enormous economic, social, and environmental benefits even in accounting education, reinforcing SDG 4 (Quality Education) while supporting SDG 12 (Responsible Consumption) and SDG 13 (Climate Action.

5.3 Theoretical Implications

Theoretically, this review extends the triple bottom line framework (Elkington, 1997) [15] to accounting education by demonstrating how blended learning simultaneously addresses pedagogical, environmental, and economic dimensions of sustainability. However, the findings suggest a hierarchical relationship: pedagogical sustainability enables environmental and economic gains, not the reverse. Specifically, pedagogical improvements (active learning, competency development) lead to environmental gains (reduced paper, lower emissions), which are accompanied by economic benefits (cost savings, scalability). This refines existing models that treat the three pillars as equal and independent. In the context of accounting education, effective teaching must come first; environmental and economic sustainability follow as outcomes, not drivers.

5.4 Comparison with Previous Research

Our findings support Brinia *et al*. (2025) [11] and Kottara *et al*. (2025) [30], who found that blended learning promotes deeper learning and develops a culture of responsibility in accounting students. However, this review extends their work by quantifying the thematic distribution across 68 studies, revealing that pedagogical concerns dominate the literature while economic considerations remain underexplored. Unlike Barteit *et al*. (2021) [9], whose systematic review focused on sustainability education broadly, this review specifically addresses accounting education—a discipline historically resistant to pedagogical innovation due to rigid accreditation requirements and technical content demands (Viviers & Villiers, 2020) [52].

5.5 Challenges and Limitations of Existing Research

The literature reveals several challenges. First, most studies are cross-sectional, measuring short-term outcomes rather than long-term sustainability impacts. Second, digital equity remains a concern: students without reliable internet access or modern devices cannot fully benefit from blended learning (Seleke, 2024; Shaya *et al*., 2025) [43, 46]. Third, academic integrity in online assessments is frequently cited but rarely solved. Fourth, faculty preparedness varies widely, with older accounting faculty sometimes resisting technology adoption.

6. Conclusions

This study investigated the relationship between blended learning and sustainable development in accounting courses. The results demonstrate that blended learning advances sustainability across three dimensions: pedagogical (34 studies), environmental (22 studies), and economic (12 studies). The pedagogical dimension is most critical, suggesting that effective teaching enables environmental and economic gains, not the reverse.

University accounting programs must align with labor market demands by providing educational knowledge and skills that develop a fully sustainable culture. Students increasingly focus on sustainability and its effects on environmental protection, social cohesion, and economic prosperity. Blended learning encourages high-quality, lasting learning, particularly in courses like financial accounting, through innovative educational models based on social constructivism. This review has several limitations. First, it relies on secondary literature rather than primary empirical data. Second, the search was limited to English-language sources. Third, the rapid evolution of educational technology may render some findings time-sensitive. Fourth, the review does not differentiate between undergraduate and graduate accounting education contexts. Future research should address four areas. First, longitudinal studies measuring the long-term environmental impact of blended learning in accounting programs are needed. Second, comparative studies across developing and developed countries would clarify how digital equity affects sustainability outcomes. Third, empirical research on student perceptions of sustainability-focused blended learning is lacking. Fourth, the effectiveness of specific tools (e.g., virtual simulations vs. discussion forums) for teaching sustainability assurance remains unexplored.

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