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A Systematic Review Of Emerging Evidence On Artificial Intelligence And Sustainable Entrepreneurship From 2019 To 2026

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ABSTRACT

Artificial intelligence is increasingly framed as a driver of sustainable entrepreneurship, yet the empirical literature remains young, fragmented, and largely unconsolidated. This review synthesises 84 Scopus-indexed studies published between 2019 and 2026, drawn from articles, reviews, and conference papers and assembled following PRISMA principles for identification, screening, and inclusion. Source quality was treated as an analytical variable during synthesis instead of a filter applied at the eligibility stage. Two analytical passes were combined: a bibliometric mapping of author-keyword co-occurrence using VOSviewer, and a systematic, inductively coded reading of the literature organised under five themes covering opportunity recognition, eco-innovation, resource optimisation and circular business models, organisational capability in small and medium-sized enterprises, and entrepreneurship education alongside the ethics of generative AI. A consistent pattern emerges across all five themes: artificial intelligence rarely acts on sustainable entrepreneurship directly. It works through knowledge management, green innovation, and dynamic capabilities, and its measured effect weakens sharply once these organisational conditions are missing. The co-occurrence map reinforces this reading: artificial intelligence sits as a hub connecting every theme without forming a self-contained research conversation of its own, which supports describing it as a conditional enabler and not a prime mover. The evidence base skews cross-sectional in design and concentrates heavily in Chinese and Gulf manufacturing samples. Southeast Asia, and Vietnam in particular, appears mainly through student-intention surveys, with firm-level or ecosystem evidence largely missing, marking the clearest opening for context-specific research. For research and policy in Southeast Asian economies pursuing state-led digital agendas, this points to a practical risk: investing in artificial intelligence without first building the absorptive capacity to translate it into sustainability outcomes may produce formal compliance instead of genuine transformation...

Keywords: Artificial intelligence; Sustainable entrepreneurship; Systematic literature review; Green innovation; Knowledge management; Vietnam...

INTRODUCTION:

The promise attached to AI in sustainability circles is large and specific: that machine learning, big data, and generative models will let new ventures spot environmental opportunities, cut waste, and build greener business models faster than before. The empirical literature is younger and more cautious than that framing suggests, having grown almost entirely in the past three years — fewer than three studies a year before 2022, then sixteen in 2024 and thirty in 2025, tracking the diffusion of generative AI after late 2022.

That gap between enthusiasm and evidence is what this review addresses. Across the body of work linking AI to sustainable entrepreneurship, individual studies report effects in different directions and definitions, and no synthesis has yet asked what the accumulated evidence actually supports. Reviews make up under five percent of publications in this space, leaving the consolidation work undone precisely as the primary literature accelerates.

Three questions organise the analysis: the mechanisms through which AI affects sustainable entrepreneurial activity, whether directly or by way of other organisational capabilities; how the evidence clusters thematically and how stable those clusters are; and where the gaps lie for a research and policy agenda, particularly in emerging economies whose institutional conditions differ from the settings that generated the evidence.

The review's central finding shapes how the rest is read: AI rarely acts on sustainable entrepreneurship on its own. It works through knowledge management, green innovation, and dynamic capabilities, and where those conditions are absent its effect attenuates. AI is better understood as a conditional enabler than a prime mover — a reframing that matters most for Southeast Asia, and Vietnam specifically, where the technology is spreading into settings whose absorptive capacity cannot be assumed.

2. THEORETICAL BACKGROUND

This review sorts studies by the mechanism through which AI is thought to act, not by the domain where it is applied, and three bodies of theory recur across the corpus to support that choice. The dynamic capability view treats a firm's ability to sense, seize, and reconfigure resources as the bridge between a new technology and any performance gain it produces; several studies invoke this

framing directly to explain why AI helps some SMEs and not others (Alajmi, 2026). Others draw on the knowledge-based view, in which green knowledge management converts AI's informational output into innovation outcomes, a path made explicit in the corpus's most-cited eco-innovation study (Wang & Zhang, 2024). A further distinction, between weak and strong forms of sustainability, separates efficiency gains that leave underlying resource use unchanged from transformations that alter it; the corpus's reviews use this distinction to ask how much of the reported AI-sustainability link reflects genuine transformation and how much is incremental optimisation (Bickley et al., 2025). The question this review pursues follows from these three lenses: not whether AI predicts sustainable entrepreneurship outcomes, but under what capability and knowledge conditions that relationship holds.

3. METHODOLOGY

The review is reported in line with PRISMA principles across identification, screening, and inclusion, adapted at the eligibility stage in one respect made explicit below (Figure 1 summarises the flow). The aim was a corpus transparent enough to reproduce exactly, rather than one filtered down to a curated ideal.

3.1 Data source and search strategy

Records were drawn from Scopus, queried once on 7 June 2026, for its coverage of business, management, and computer-science literature. The search targeted titles, abstracts, and keywords with a Boolean string pairing AI terms with sustainable-entrepreneurship terms:

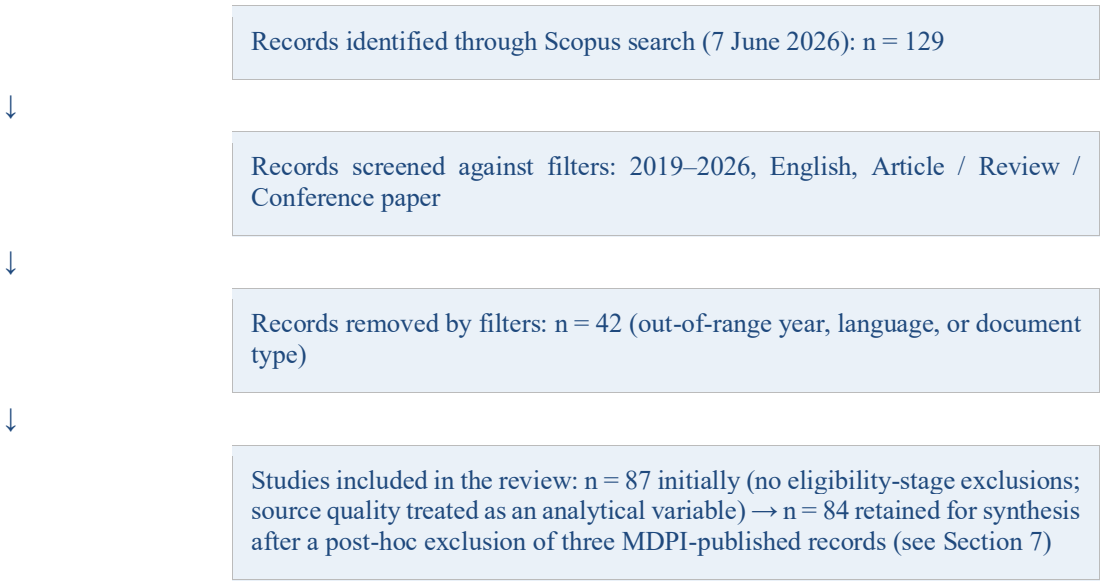
TITLE-ABS-KEY((“artificial intelligence” OR “machine learning” OR “generative AI”) AND (“sustainable entrepreneurship” OR “green entrepreneurship” OR “environmental entrepreneurship” OR “sustainable startup” OR “sustainable startups” OR “green business”))

The string was settled after piloting: a broader formulation returned 524 records, too many only loosely related; a narrower title-and-keyword-only variant returned 118. The final string returned 129 records — a result not sensitive to the precise field combination, though not independent validation, since all variants draw on the same database and conceptual pairing.

3.2 Screening and inclusion

Filters restricted the 129 records to documents published 2019–2026, in English, classified as Article, Review, or Conference paper; the earliest qualifying record dates to 2019. Because all records came from a single database, no duplicates required removal, yielding a corpus of 87 studies. Here the review departs from standard practice: no further studies were excluded at the eligibility stage. All 87 records were initially retained, with source quality treated as a variable rather than a gate. High-citation work in established journals was weighted as load-bearing evidence; single-case studies and conference papers were read as supporting evidence. A post-hoc publisher check found five of the 87 records in MDPI-affiliated journals: three in Sustainability (Switzerland), one in Behavioral Sciences, one in Administrative Sciences. The three Sustainability records — Akçaba et al. (2026), Alshammakhi and Sheikh (2025), Li and Byun (2026) — were dropped, since Sustainability was removed from Norway's national register of approved publications in 2022 and downgraded to Level 0 by Finland's Publication Forum in 2023; the other two titles carry no comparable history and were kept. This leaves a final corpus of 84 studies: 69 percent journal articles (58), 26 percent conference papers (22), and under 5 percent reviews (4).

Figure 1. Study selection flow (adapted from PRISMA)



3.3 Analysis

The corpus was examined in two passes: a bibliometric pass mapping author-keyword co-occurrence in VOSviewer (minimum three occurrences) into five colour-coded clusters, and a systematic pass involving close reading and inductive coding under five themes, coded for the role AI plays in the mechanism rather than the domain of application. Geographically the field is led by India (20 studies), China (14), and the United States

(10), followed by Taiwan (8) and a band at five studies each including Lebanon, Türkiye, the United Kingdom, and Vietnam. India's lead is weighted toward conference-stage and applied work rather than the high-citation studies that carry the synthesis; Vietnam's appearance in the next tier is prominent enough to signal regional relevance and sparse enough to mark the gap this review returns to.

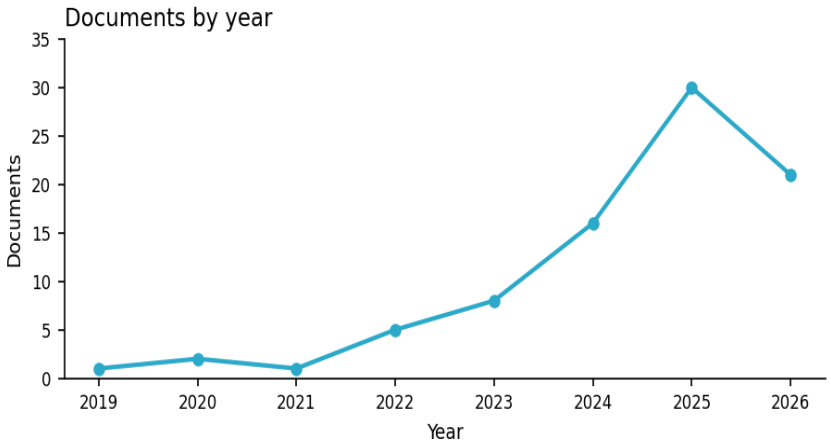


Figure 2. Documents by publication year (Scopus, n = 84).

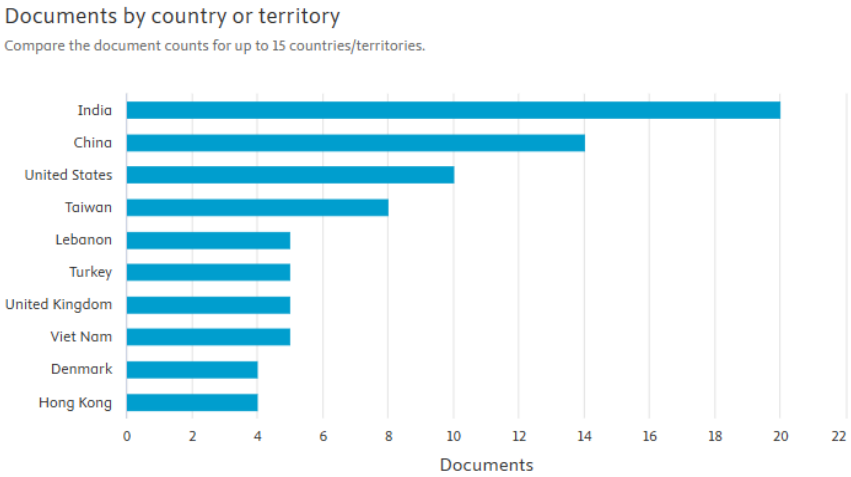


Figure 3. Documents by country or territory (top 10).

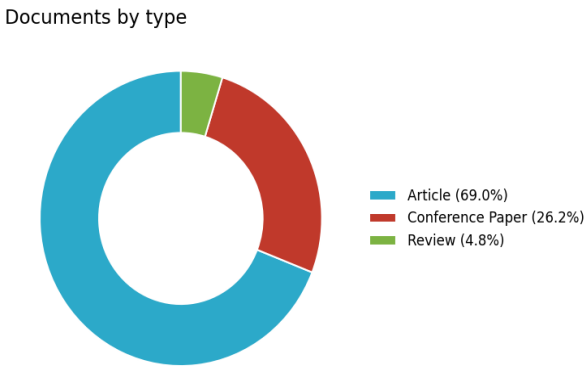


Figure 4. Documents by type: Article 69.0%, Conference 26.2%, Review 4.8%.

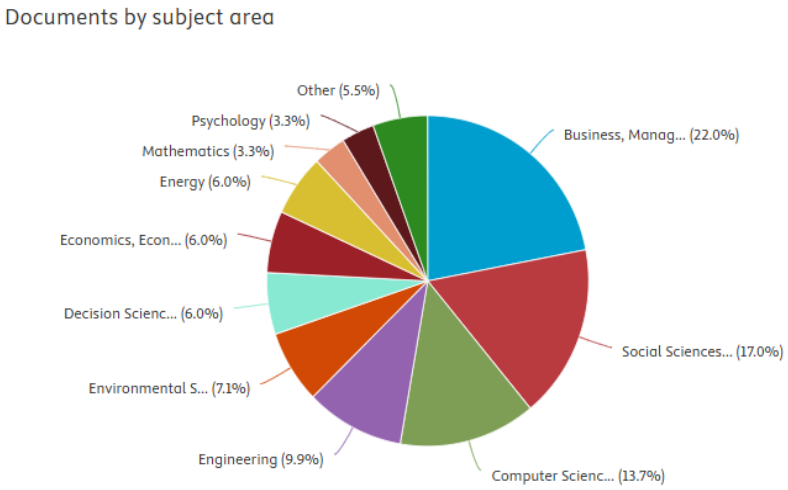


Figure 5. Documents by subject area.

4. Bibliometric overview: keyword co-occurrence

A co-occurrence map of author keywords offers a structural check on the thematic reading developed below. Terms appearing together across the eighty-four studies resolve into five colour-coded clusters, with a match to the five hand-coded themes that is looser than in the original run — the boundary between entrepreneurship education and generative AI has moved, which fits the Theme 4/5 overlap noted in the discussion. Read as a rough cross-check rather than independent confirmation, the map still supports the thematic structure, with less precision than a first glance would suggest.

One cluster groups sustainable entrepreneurship, entrepreneurship, research trends, and machine learning. A second centres on artificial intelligence itself, tied to sustainable development, the SDGs, and entrepreneurship education — pulling the education theme closer to the technology than to the pedagogy literature it sits with in the manual coding. A third links dynamic capabilities, generative AI, green entrepreneurship, and green innovation, merging Theme 2's capability mechanism with the generative-AI strand of Theme 5. A fourth, smaller cluster connects big data and circular economy. A fifth, also small, pairs a separately labelled "artificial intelligence (ai)" node with green business — a thesaurus pass merged the bare "ai" abbreviation into the main node, but this one parenthetical variant remained distinct, a minor labelling artefact rather than a substantive finding.

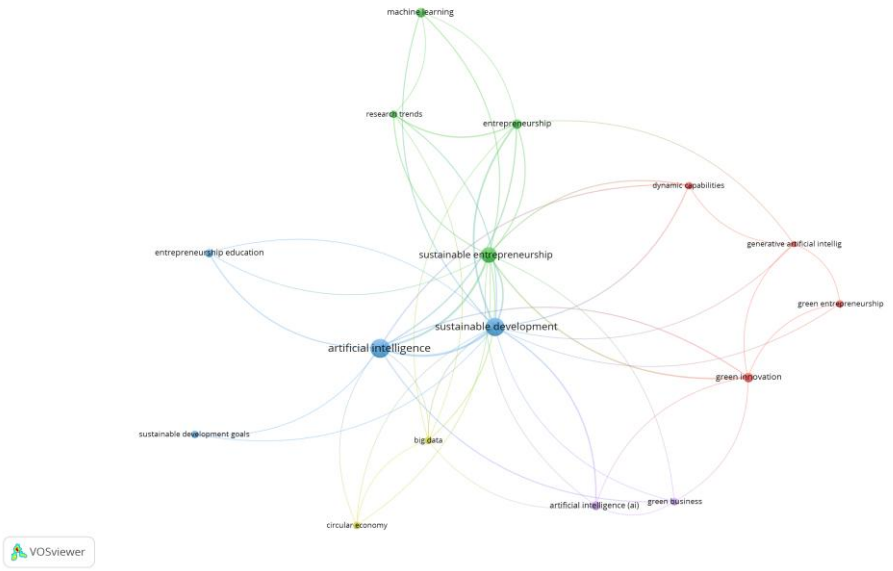


Figure 6. Author-keyword co-occurrence map (VOSviewer, minimum three occurrences, n = 84).

Two things about the map matter more than the cluster boundaries. The three largest nodes — sustainable entrepreneurship, artificial intelligence, and sustainable development — sit where several clusters meet rather than inside just one. AI does not form a self-contained cluster; it behaves as a hub that different thematic neighbourhoods draw on, matching the review's central argument that AI operates as a connecting capability rather than a bounded subject with its own dedicated research conversation.

The more AI-specific terms sit further out and carry thinner connections than the two hub terms; the densest part of the map is still occupied by sustainable entrepreneurship and sustainable development constructs that predate the AI turn. The picture matches the original

map: a field that has absorbed AI into an existing research vocabulary rather than reorganised itself around the technology.

5. THEMATIC FINDINGS

Table 1. Corpus synthesis by theme

Theme	n	Load-bearing studies (journal-anchored)	Dominant design	Recurring mechanism
Opportunity recognition	4	Ha et al. (2025); Floriano Rodriguez et al. (2026)	Cross-sectional / student surveys	AI as cognitive input to intention (indirect)
Eco-innovation	10	Wang & Zhang (2024, 101 cit); Liu et al. (2026); Ahmed et al. (2026); Colombelli et al. (2025)	PLS-SEM; topic modelling	Green knowledge management → green innovation
Resource optimisation & circular economy	27	Mansouri & Momtaz (2022, 190 cit); Chotia et al. (2024, 60 cit); Bickley et al. (2025, 84 cit); Ojong (2025)	Cross-sectional; review; ML measurement	Conditional enabler via innovation routine / regulation
SME organisational capability	9	Gupta et al. (2023a, 163 cit); Appio et al. (2024); Rehman et al. (2025); Alajmi (2026)	Bibliometric; patent; SME survey	AI mediated by KM & process redesign
Education & ethics of GenAI	26	Amjad et al. (2020, 53 cit); Kong et al. (2025); Kirchner-Krath et al. (2026); Pham et al. (2025)	Cross-sectional; design-and-build; survey	Indirect via motivation/self-efficacy; double-edged GenAI
Reviews (cross-cutting)	8	Bickley et al. (2025); Ojong (2025); Gupta et al. (2023a)	Systematic / bibliometric	Boundary-conditioned, weak-vs-strong sustainability
Total	84	—	—	—

5.1 Theme 1 — AI and the recognition of sustainable opportunity

Long before a business plan exists, someone has to notice that a waste stream could become a product, that a regulatory gap could become a market, or that a community problem could be solved at a profit. This act of noticing, opportunity recognition, has always been the hinge on which entrepreneurship turns, and this small cluster asks whether AI changes who does the noticing and how well. Four studies address it directly. The evidence is early and uneven: none had accumulated meaningful citations at the time of search, most rely on student samples, and one (Ahmić & Šahović, 2025) draws on just forty respondents. What the cluster offers is not settled fact but a consistent first reading.

The most methodologically careful work in this group treats AI as something that feeds the entrepreneur's own judgment instead of replacing it. Ha et al. (2025), extending the theory of planned behaviour with two AI-specific constructs, test 217 Vietnamese university students and find that comfort and competence with AI tools shape sustainability-oriented entrepreneurial intentions. AI enters here as a competency the individual holds, not an external force acting on the person.

A second group widens the lens from intention to the broader entrepreneurial process. Floriano Rodriguez et al. (2026), using mixed methods with 295 Peruvian entrepreneurs, report strong positive associations between AI use and five dimensions of the sustainable venture process, though their qualitative phase surfaces technology gaps and regulatory uncertainty as real constraints. Ahmić and Šahović (2025) reach a similar conclusion with forty entrepreneurs in Bosnia and Herzegovina, though the small sample limits it to corroboration.

One study inverts the usual relationship, using AI to study entrepreneurs instead of studying entrepreneurs' use of AI. Rani et al. (2024) apply machine-learning algorithms to survey data on green qualities and entrepreneurial skills among engineering students, signalling AI as the researcher's instrument rather than the entrepreneur's tool.

Across the four studies in this cluster, spanning Vietnam, Peru, and Bosnia, AI enables the cognitive and processual front end of sustainable entrepreneurship indirectly, working through the entrepreneur's own competencies and conditioned by training, infrastructure, and regulation; it never appears as the autonomous source of the opportunity itself. Two gaps stand out: the design base is thin, with cross-sectional surveys and student samples leaving causal direction untested, and despite a strong Vietnamese study (Ha et al., 2025), Southeast Asia remains barely mapped beyond student intention.

5.2 Theme 2 — Artificial intelligence and eco-innovation

A founder who wants to bring a lower-emission product to market faces a knowledge problem before a technology problem: the relevant green knowledge sits scattered across patents, regulations, and scientific literature no small team can read fast enough. The ten studies here converge on where AI fits: it rarely produces green innovation on its own, but accelerates the acquisition and application of green knowledge, from which green innovation follows.

The strongest study makes the mediation explicit. Wang and Zhang (2024), in Technology in Society (101 citations), built a knowledge-innovation model tested with PLS-SEM and fsQCA: generative AI adoption raised green innovation only by first raising green knowledge management capability, explaining roughly 41% of the variance in green entrepreneurship success, with government funding amplifying rather than creating the link. Cai et al. (2025) offer a conceptual companion integrating the same constructs, though as a conference paper it supplies scaffolding rather than a test.

A second group treats AI as one capability among several a venture must orchestrate. Alwakid and Dahri (2025) find AI capabilities feed SME creativity and green innovation, with sustainability following from the bundle rather than AI alone. Liu et al. (2026), with 387 Chinese manufacturing managers, show green business strategy and AI capability shaping sustainable performance through knowledge integration and green innovation, moderated by environmental dynamism. Ahmed et al. (2026) route AI-enabled talent acquisition to sustainable performance through environmental innovation capability and human-capital agility in 837 US SMEs, and Selvan et al. (2026) report a complementary AI–green entrepreneurship synergy. The recurrence of mediated paths across different journals and settings is the cluster's most defensible regularity.

A distinct strand uses AI to detect or model green innovation rather than enable it. Colombelli et al. (2025) applied topic modelling to Italian startup websites and showed green venture creation tracks the match between a province's knowledge stock and demand for sustainability. Ye and Chen (2026) and Hao et al. (2026) apply similar machine-learning econometrics to Chinese panel data, both finding green innovation as the transmission channel. In each case the machine learning is research instrumentation: AI sharpens what researchers can detect without itself being the innovative act.

AI's contribution to eco-innovation runs consistently through green knowledge management, conditioned by government support or environmental dynamism. Two gaps temper this reading: the designs are overwhelmingly cross-sectional, so causal direction remains assumed rather than demonstrated, and the empirical centre sits in East Asia, with Southeast Asia and Vietnam specifically absent. That gap matters because the moderators carrying these models, state support and regulatory dynamism among them, are exactly the variables that differ most across institutional settings.

5.3 Theme 3 — AI for resource optimization, circular economy, and green business models

Manufacturers and startups face a hard arithmetic problem: cut emissions and waste while staying solvent. The twenty-seven papers here treat AI largely as a decision-support layer wrapped around resource decisions firms were already trying to make, rather than as a green innovation in its own right.

The strongest evidence shows AI improving environmental outcomes only through something else. Chotia and colleagues (2024) found AI-enabled green business strategy raised environmental performance only when green process innovation mediated the relationship. Hwang and co-authors (2025) reported the same shape for circular-economy adoption, and Chau and colleagues (2026) found AI-based recycling analytics fed green entrepreneurial success only through knowledge innovation systems. Across three independent samples, AI's contribution to resource efficiency is real but contingent on the organisational capability or regulatory pressure sitting between the tool and the outcome.

A second group turns AI on the financing side, where the binding constraint is information rather than material. Mansouri and Momtaz (2022), the most-cited paper in the corpus, built a machine-learning method to score startups' ESG properties from whitepaper text: a one-standard-deviation rise in the score raised funding by 28 percent but cut post-funding returns by 16 percent. The contribution is methodological — AI made an intangible measurable at scale. Tan and colleagues (2025) link ESG sentiment to energy innovation through financing constraints, and Ramar and co-authors (2026) build AI-driven blockchain lending toward green businesses. AI's resource contribution here is informational rather than physical.

Two papers push back on the optimism. Bickley, Macintyre, and Torgler (2025) argue AI and big data advance the weak form of sustainability comfortably but reach the strong form only under conditions barely specified. Ojong (2025) is sharper: efficiency and transparency gains can curdle into deferred costs and distributional injustices, hinging on five boundary conditions. Both reinforce the same reading from a different angle — AI's value here is bounded, conditional, and capable of rebounding into harm.

The remaining papers form a wide but evidentially lighter band — the Lindgren papers (2021, 2024) on green multi-business-model design, Rastogi and colleagues (2025) reporting up to 30 percent energy gains from AI–IoT integration, among others. These are useful for mapping

claimed applications but treated as supporting rather than load-bearing evidence, since many report single-case or simulation results without strong identification strategies.

This cluster supports a cautious claim: AI contributes to resource optimisation mainly as a conditional enabler operating through innovation capabilities and regulatory pressure, and as an informational tool for allocating capital. The causal evidence skews correlational and cross-sectional, so the deferred costs Ojong warns about remain largely untested, and the empirical base tilts toward China and India; Southeast Asian contexts, including Vietnam, are almost absent despite the region's exposure to the same pressures.

5.4 Theme 4 — AI as organisational capability for green SME transformation

A small manufacturer buys an AI-enabled analytics tool expecting a sustainability edge; months later little has changed, because nobody translated its outputs into revised processes. This gap organises the nine studies here: AI rarely improves sustainability alone, but does so when a firm already possesses the routines and knowledge structures to absorb what the technology offers.

The two highest-cited works frame the field rather than test a mechanism. Gupta et al. (2023a) map 482 Scopus documents and report a broadly positive AI–sustainable-development association. Appio et al. (2024) analyse AI patents and find AI operating simultaneously as a technological and strategic asset bridging the digital and sustainability transitions. Both treat AI as enabling infrastructure that firms must still execute.

Knowledge management surfaces again as the conversion mechanism. Rehman et al. (2025), on 250 Pakistani manufacturing managers, find green business process optimisation mediates the path from green intellectual capital to environmental performance, with AI moderating several links, though not the green-human-capital path — exposing the difficulty of integrating AI into people-centred management.

A second mechanism frames AI as part of a wider digital toolkit letting resource-constrained firms reconfigure assets. Alajmi (2026) synthesises 80 studies through dynamic capability theory, arguing digital transformation helps SMEs sense, seize, and reconfigure resources toward sustainability. Kulova et al. (2024) ground this in manufacturing and logistics, flagging equipment cost and data-network needs as real barriers. Wang and Abdykadyrov (2025) build an AI–IoT green-finance system outperforming conventional credit scoring, and Trung et al. (2026), using Vietnamese data, find government regulation and customer demand dominate green transformation, with AI in a supporting role.

The defensible claim here is narrow but well supported: AI contributes to sustainability primarily as an organisational capability mediated by knowledge management, not as a standalone driver. The mechanism evidence leans heavily on cross-sectional surveys and single cases, leaving causal direction untested, and Southeast Asian evidence is thin — Hidayati et al. (2026) and Trung et al. (2026) gesture at Indonesia and Vietnam, but no study examines how Vietnamese SMEs build the absorptive capacity this cluster identifies as decisive.

5.5 Theme 5 — AI in sustainable entrepreneurship education and the ethics of generative AI adoption

The twenty-six papers here mostly ask how AI reshapes the teaching and skill-building that precede a green venture; a smaller group asks what generative AI does to the entrepreneur once adopted, including the harms. Second only to Theme 3 in size, this is also the corpus's youngest and least settled theme, with many zero-citation conference papers.

The centre of gravity is pedagogical. Amjad and colleagues (2020), the most-cited paper, name a gap AI has only widened: business-school pedagogy borrows methods never built for entrepreneurship. Gupta, Gaurav, and Panigrahi (2023a), the corpus's second most-cited study, map AI-based approaches onto sustainable entrepreneurship, positioning technology-mediated learning among the practices forming the field. Around these anchors sits design-and-build work — Cocu and co-authors (2025a) on generative-AI e-learning, Turcu and colleagues (2026) on an ML-driven Moodle ecosystem — establishing that AI personalises and scales education delivery, though largely through platform demonstrations rather than outcome evaluations.

A second, more disciplined group treats AI as one input into whether students intend to start sustainable ventures, and the effect is consistently indirect. Pham, Duong, and Ngo (2025), surveying 687 Vietnamese tourism and hospitality students, found perceived AI value feeding entrepreneurial intention through motivation. Adjimah and colleagues (2026), with 1,053 Ghanaian students, traced education components to green entrepreneurship intentions through personal values, significant but with small direct effects. AI rarely moves intention on its own; it works through motivation, values, and self-efficacy, the same conditional logic seen elsewhere.

The sharper contribution comes from papers that refuse the optimistic reading. Kong and colleagues (2025) demonstrate a genuine double-edged sword: generative-AI adoption raised sustainable entrepreneurial intention among Chinese business students by building self-efficacy while simultaneously depressing it through fear of failure. Kirchner-Krath and co-authors (2026), on 128 German environmental entrepreneurs, map GenAI's roles alongside its threats to the dual mission — technical immaturity, regulatory uncertainty, bias, environmental harm. Shabbir and Keshtiban (2026) add a governance lens, specifying algorithmic legitimacy and accountability as conditions on GenAI's value. Together these establish the theme's most defensible critical claim: GenAI's contribution is bounded by human judgment, governance, and its own ethical costs.

Two claims summarise this cluster: AI is absorbed into education primarily as a personalisation technology, and into intention formation as an indirect input working through motivation and values. The stronger contribution is generative AI's documented double-edged character — building self-efficacy while raising governance, bias, and environmental costs that cut against its own mission. The

evidence base is thin and recent, dominated by zero-citation proceedings, and Southeast Asian educational contexts remain underexamined despite two of the more useful intention studies being Vietnamese.

6. DISCUSSION

The thematic structure surfaced a tension worth naming directly: Themes 4 and 5 overlap substantially, with roughly eighteen to twenty studies in the education-and-ethics cluster whose empirical content concerns competence as much as ethical risk. This is not a coding defect but a finding: work on AI in entrepreneurship education cannot keep questions of competence and ethics apart. Studies that set out to build students' AI capabilities (Ha et al., 2025; Trung et al., 2026) keep arriving at responsible-use and over-reliance concerns; studies framed around GenAI's risks keep landing in the classroom as the site where those risks are managed. The same permeability runs through the corpus more broadly — classifying studies by the domain AI is applied in proves less stable than classifying them by the role AI plays in the mechanism, and several studies sit comfortably in more than one cluster.

The evidence base is also geographically lopsided in a way that shapes what can be claimed. India contributes the most documents (20), but they cluster in conference and applied work this review weights as supporting rather than load-bearing; empirical depth instead sits in China, the Gulf states, Taiwan and Hong Kong, and parts of Europe. Southeast Asia appears mainly through student-intention surveys — Ha et al. (2025) and Trung et al. (2026) on Vietnamese samples — rather than firm-level or ecosystem evidence. This is a substantive gap: the mediation models that dominate the corpus assume an institutional backdrop of mature knowledge-management systems and policy support that does not transfer cleanly to lower-middle-income Southeast Asian economies, and Theme 4's SME evidence itself cautions that heavy reliance on policy incentives can tip firms toward formal compliance rather than substantive transformation. Whether the knowledge-mediated AI mechanism holds where those institutional preconditions are weaker is, on this evidence, untested — and is, for a Vietnamese research setting, the most actionable opening this review identifies.

7. LIMITATIONS AND FUTURE RESEARCH

Every choice that made this review reproducible also bounded what it can claim. The corpus was built from a single Scopus query executed on one date, restricted to English-language articles, reviews, and conference papers — a decision that buys transparency at the cost of coverage, since non-English work and very recent preprints fall outside the frame. The query was also deliberately broad, pulling in studies only tangentially related to sustainable entrepreneurship (infrastructure security, next-generation networks, high-net-worth investment among them); these were retained rather than silently dropped, which means the eighty-four studies are not a clean population so much as a transparent one.

Source quality varies sharply within that population, and the review weighted its interpretation accordingly: findings anchored on high-citation work in established journals carry more of the argument than single-case conference papers, a defensible but judgement-laden strategy. The thematic boundaries are likewise interpretive rather than natural, organised by the role AI plays in a mechanism rather than the domain it is applied in.

As noted in Section 3.2, three MDPI-published records were excluded post-hoc following documented national-registry delisting concerns, while two others were retained; the asymmetric treatment is reported there in full for transparency.

Three openings follow from these limits. Geographically, whether the knowledge-mediated mechanism survives in institutional settings with weaker AI infrastructure than the Chinese and Gulf samples that dominate the corpus is untested, and is the opening this review judges most worth pursuing. Methodologically, the causal core rests on a narrow base of cross-sectional PLS-SEM studies on structurally similar samples; longitudinal designs and process tracing would do more to establish whether AI's contribution is causal or merely correlational. Conceptually, "AI" in this literature ranges from machine-learning research instruments to generative tools to self-reported capability constructs, and disaggregating the term would let future work test whether the conditional-enabler pattern holds uniformly or varies by system.

8. CONCLUSION

The clearest result of this review is also its most deflationary. Across eighty-four studies spanning 2019 to 2026, AI rarely acts on sustainable entrepreneurship on its own; it works through knowledge management, green innovation, and dynamic capabilities, and where those conditions are absent, its measured effect fades. AI emerges as a conditional enabler rather than a prime mover, reinforced by the co-occurrence map: AI sits as a hub connecting every theme, yet forms no self-contained research conversation of its own.

For research, this reframes the question: not whether AI advances sustainable entrepreneurship, but under what organisational and institutional conditions it does — conditions that, on this evidence, are knowledge capability and institutional support, neither of which can be assumed where the technology is now spreading fastest. For practice and policy in Southeast Asian economies pursuing state-led digital agendas, the implication is sobering: investing in AI without the absorptive capacity to translate it into action risks compliance over transformation.

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