Islamic entrepreneurship education in the era of sustainability and digital transformation

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ABSTRACT

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Islamic entrepreneurship education is emerging as a consequential domain at the intersection of Islamic ethical values, sustainability, and digital transformation in higher education. Yet the literature remains fragmented and frequently confined to localized contexts, with limited integration into broader entrepreneurship education debates. This study maps the intellectual structure and research trends in Islamic entrepreneurship education through a systematic bibliometric review of publications from 2020 to 2025. Following PRISMA procedures, bibliographic records from Scopus, ScienceDirect, and Dimensions were analyzed using VOSViewer to examine publication dynamics, keyword co-occurrence, and collaboration patterns. The results reveal four thematic clusters: technology-oriented entrepreneurship pedagogy, entrepreneurial intention and gender-related issues, leadership and human-centered learning, and entrepreneurial culture and behavioral constructs. Publication output rises markedly after 2020 and peaks in 2023–2024, reflecting post-pandemic interest in sustainability and digital resilience. Despite this growth, gaps persist in integrating Islamic Work Ethics with sustainability frameworks, leveraging digital learning tools, and developing cross-national research collaboration. To address these limitations, the study proposes an integrative analytical lens combining Islamic Work Ethics, the Theory of Planned Behavior, and transdisciplinary learning, offering implications for theory development and for designing scalable, inclusive entrepreneurship education aligned with the Sustainable Development Goals.

1. Introduction

Islamic entrepreneurship education has become an essential aspect of transformative learning in higher education, especially as a response to global calls for aligning spiritual values with sustainable development objectives. Within Muslim communities, entrepreneurship is viewed not only as a tool for economic advancement but also as a vehicle for upholding ethical behavior and social equity based on Islamic teachings [1], [2]. However, current educational frameworks frequently fail to fully embrace this paradigm, especially within formal academic institutions. As digital transformation

accelerates and socio-economic landscapes evolve, the need for curriculum reform in Islamic entrepreneurship education becomes increasingly urgent. Islamic education is now expected to go beyond the transmission of moral and religious values, by also fostering students' resilience, innovation, and adaptability in the face of global disruptions. Yet, challenges such as low levels of digital literacy and the persistence of outdated curricula continue to impede the successful implementation of entrepreneurship education grounded in Islamic principles [3]; [4].

This research presents an original contribution by synthesizing three interconnected dimensions Islamic entrepreneurial values, sustainable learning methodologies, and the necessity of digital transformation into a cohesive analytical framework. While these elements are frequently examined in isolation within existing scholarship, their integrated treatment in this study enhances both the theoretical rigor and practical applicability of the discourse [5]; [6]. Theoretically, this study is anchored in the Theory of Planned Behavior (TPB) and Islamic Work Ethics (IWE), both of which propose that entrepreneurial intentions are shaped by individual attitudes, societal expectations, perceived control over behavior, and ethically driven values rooted in faith. Additionally, the research incorporates transdisciplinary learning theory, which advocates for holistic, context-sensitive, and cross-disciplinary approaches to curriculum development as a response to contemporary complex challenges [7]; [8].

The main objective of this study is to examine the evolving trends, prevailing gaps, and pedagogical implications of Islamic entrepreneurship education in the context of sustainable learning. It aims to identify effective curricular frameworks, evaluate educational outcomes, and recommend strategic approaches to strengthen the effectiveness of entrepreneurship programs in Islamic educational institutions, particularly across the Global South [9]. Recent global scholarship indicates a paradigm shift in entrepreneurship education—from traditional technical skill development toward models centered on values, sustainability, and purpose-driven learning. Despite this progression, Islamic educational institutions have yet to fully adopt this approach. Numerous programs continue to fall short in incorporating Islamic ethical foundations with social entrepreneurship, digital innovation, and systems-oriented thinking [10]; [11].

In the Indonesian context, Islamic boarding schools and higher education institutions have initiated entrepreneurship programs aligned with Islamic teachings. However, these efforts are often constrained by a lack of interdisciplinary curricula, insufficient instructional design, and limited teacher training on value-based entrepreneurship education [12]; [13]. Another persistent issue is the underutilization of digital technologies in Islamic entrepreneurship education. While the global economy demands digital fluency, Islamic institutions often lag behind in integrating e-learning tools and digital business models into entrepreneurship curricula [14]; [15].

The alignment between Islamic education and the Sustainable Development Goals (SDGs) also remains fragmented. Islamic entrepreneurship education has the potential to play a transformative role in achieving SDGs, but this requires intentional curriculum design that bridges Islamic principles with sustainability frameworks [6]; [16]. Furthermore, the integration of Islamic finance into entrepreneurship education offers strategic opportunities for value-aligned funding models. Profit-and-loss-sharing mechanisms in Islamic banking can provide ethical and sustainable alternatives to conventional financial systems, particularly for young Muslim entrepreneurs [17].

Recent bibliometric studies reveal an increasing scholarly interest in the intersection between entrepreneurship and sustainability. Yet, only a small fraction of this literature addresses Islamic frameworks, indicating a significant research gap and a need for more inclusive academic discourse [18]; [19]. Ultimately, this study contributes to the ongoing discourse on educational innovation by proposing a contextualized, value-based, and forward-looking model of Islamic entrepreneurship education. Amid accelerating technological and societal change, Islamic institutions must evolve to cultivate graduates who are not only pious but also entrepreneurial, socially conscious, and capable of creating sustainable impact in their communities [20].

2. Method

The methodological framework of this study is anchored in a systematic bibliometric analysis that is integrated with a Bibliometric-Systematic Literature Review (B-SLR) logic [14]; [21], meaning that quantitative mapping is deliberately coupled with structured qualitative synthesis so the contribution is not limited to visualizing trends but also explains what those trends imply for theory and future research. This design follows the replicability and transparency standards commonly recommended for bibliometric studies in business and management research, particularly the expectation that search strategies, cleaning decisions, and mapping parameters are fully auditable and reproducible [22], [23].

Data were retrieved in early January 2026 from Scopus, ScienceDirect, and Dimensions to ensure broad coverage while maintaining metadata compatibility for bibliometric mapping. Searches were restricted to structured bibliographic fields rather than full-text, using Title–Abstract–Keywords in Scopus, Title/Abstract/Keywords in ScienceDirect, and Title plus Abstract in Dimensions, because co-occurrence, co-authorship, and citation mapping depend on consistent metadata fields and controlled indexing rather than heterogeneous full-text retrieval [22], [23]. In Scopus, the exact query executed in the TITLE-ABS-KEY field was: TITLE-ABS-KEY(("islamic entrepreneurship" OR "muslim entrepreneurship" OR "islamic entrepreneur*" OR "muslim entrepreneur*") AND ("entrepreneurship education" OR "entrepreneurial education" OR curriculum OR pedagogy OR learning OR training) AND (sustainab* OR "sustainable learning" OR "education for sustainable development" OR ESD OR SDG* OR digital* OR technolog* OR "online learning")) AND PUBYEAR > 2019 AND PUBYEAR < 2026 AND (LIMIT-TO(DOCTYPE,"ar") OR LIMIT-TO(DOCTYPE,"re")) AND (LIMIT-TO(LANGUAGE,"English")) AND (LIMIT-TO(SUBJAREA,"BUSI") OR LIMIT-TO(SUBJAREA,"ECON") OR LIMIT-TO(SUBJAREA,"SOCI") OR LIMIT-TO(SUBJAREA,"ARTS")). In ScienceDirect, the exact query used in Title/Abstract/Keywords was: ("islamic entrepreneurship" OR "muslim entrepreneurship" OR "islamic entrepreneur*" OR "muslim entrepreneur*") AND ("entrepreneurship education" OR "entrepreneurial education" OR curriculum OR pedagogy OR learning OR training) AND (sustainab* OR "sustainable learning" OR "education for sustainable development" OR ESD OR SDG* OR digital* OR technolog* OR "online learning"), with platform filters applied to include research articles and review articles, limit the publication window to 2020–2025, restrict language to English, and focus on Business/Management, Social Sciences, Economics, and Education subject areas. In Dimensions, the same query string was executed over Title and Abstract fields, with filters applied for publication years 2020–2025, document types limited to journal articles and reviews, and English-language records Fig. 2. This multi-database strategy is consistent with recommended approaches for improving coverage while maintaining methodological discipline in business-oriented bibliometric reviews [22].

Article selection was documented using PRISMA principles to ensure traceability from identification through screening and eligibility to final inclusion, with inclusion criteria requiring peer-reviewed journal articles or review articles published between 2020 and 2025, written in English, and substantively focused on Islamic entrepreneurship education in connection with sustainability-oriented learning, education for sustainable development, SDGs, and/or digital learning and innovation. Exclusions were applied to conference proceedings, editorials, notes, book chapters, and items where Islam-related terms appeared only incidentally without meaningful linkage to entrepreneurship education or learning mechanisms. PRISMA remains a widely recognized reporting standard for improving the clarity and reproducibility of evidence synthesis workflows in social science and education research [24], [25].

Records exported from the three databases in RIS and CSV formats were merged and deduplicated in Zotero, using a sequential rule set that prioritized DOI exact matching, followed by exact title matching, and then fuzzy title matching to catch minor formatting differences, with manual verification used to avoid erroneous merges where similarly titled papers could be conflated. Bibliometric mapping was then performed in VOSviewer using co-authorship, co-occurrence, and citation-based relationships to visualize intellectual structure and research fronts. Keyword co-occurrence mapping used full counting, with a minimum occurrence threshold set to balance thematic

coverage against noise reduction, while co-authorship mapping applied a minimum document threshold to reduce sparse networks and improve interpretability. Reporting these thresholds and counting decisions is critical because they materially shape cluster formation and therefore must be declared for replication and valid interpretation [22], [23].

To prevent artificial fragmentation of concepts, metadata cleaning was conducted before mapping through a VOSviewer thesaurus file that harmonized author name variants, standardized keywords, and removed overly generic terms that distort co-occurrence structures. The thesaurus explicitly merged abbreviations and synonyms into preferred labels, such as consolidating "Islamic work ethic" and "IWE" under "Islamic work ethic," and normalizing conceptual variants like "entrepreneurship intention" and "entrepreneurial intention," as well as "education for sustainable development" and "ESD," so that semantically identical constructs were not split across multiple nodes. Such controlled normalization is widely recognized as essential for producing coherent, interpretable clusters in bibliometric mapping [22], [23]. Finally, in line with B-SLR practice, the bibliometric maps were not treated as end products but as inputs to a systematic synthesis step in which representative documents from each cluster were read and coded for key constructs, mechanisms, boundary conditions, and methodological patterns. This synthesis enabled the study to translate network-level regularities into theory-relevant gaps and a forward-looking research agenda, which is exactly the move reviewers expect when a bibliometric paper claims conceptual contribution rather than simply offering descriptive cartography [26].
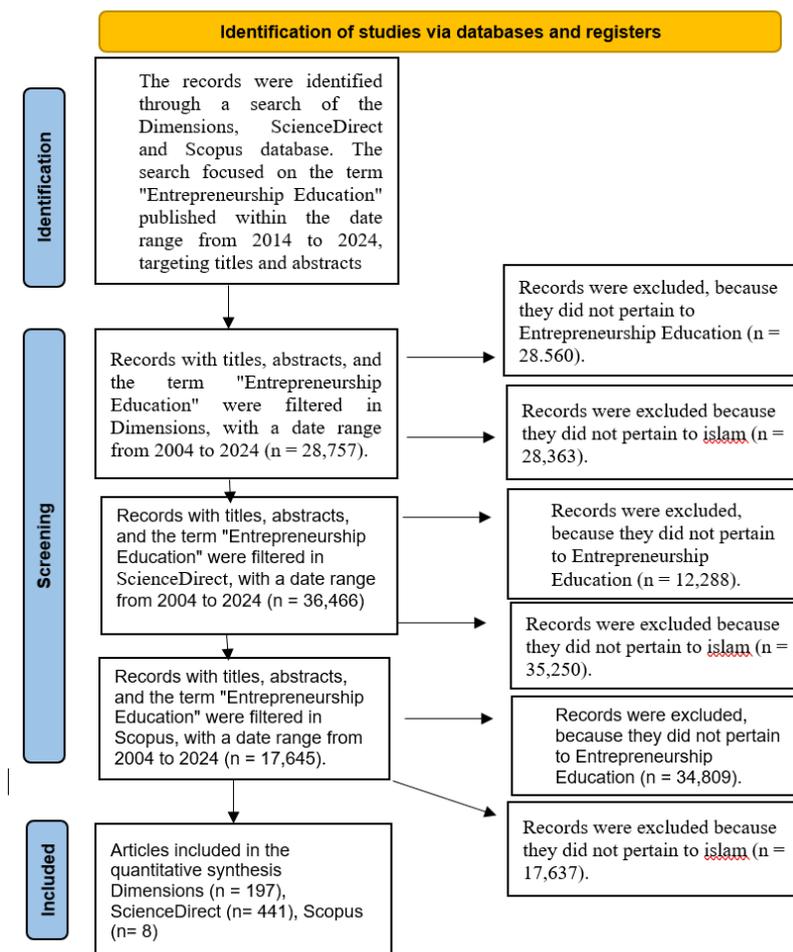

Fig 1. PRISMA flow diagram [24]

3. Results

The scholarly discourse on Islamic Entrepreneurship Education has expanded substantially over the last decade, reflecting growing interest in integrating sustainability principles, ethical frameworks, and Islamic values into entrepreneurship pedagogy [16]. This expansion is observable in the annual publication trajectory, which indicates that the field has shifted from a marginal topic into a recognizable interdisciplinary research area bridging education, entrepreneurship, and sustainability. Fig. 2 presents the annual number of publications from 2016 to 2025 and shows an early period of limited output, followed by a steady increase that signals maturation of the topic and widening scholarly attention across themes such as Islamic work ethics, sustainable business models, digital entrepreneurship, and post-pandemic recovery strategies [27]; [28].
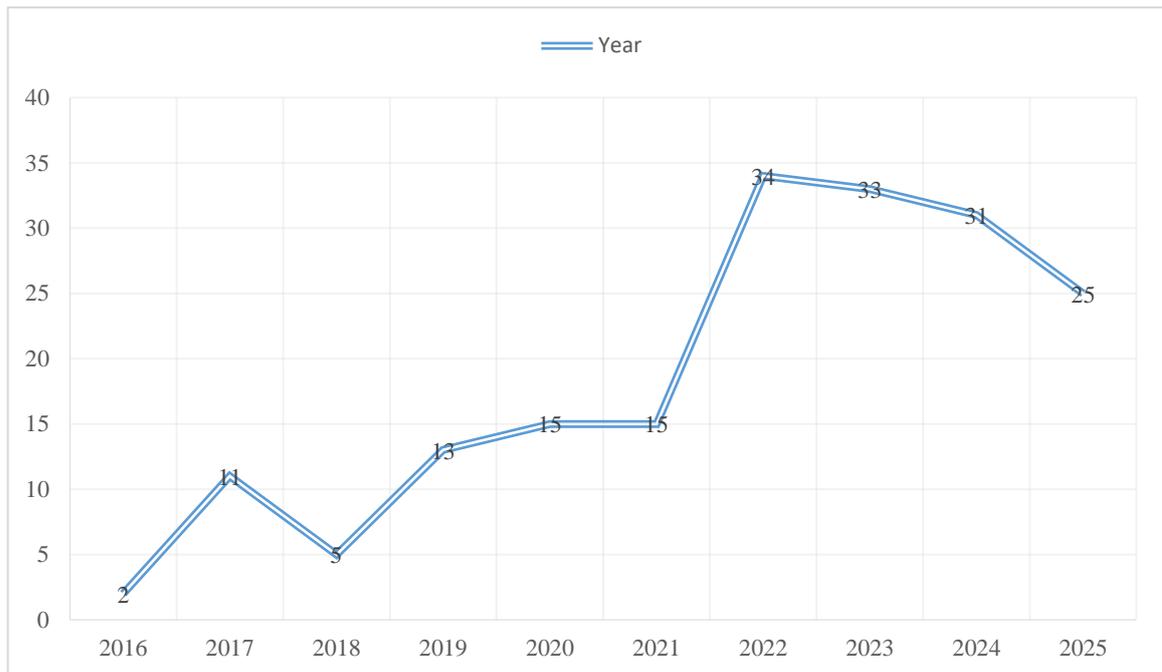

Fig 2. The number of publications on entrepreneurship education in Islamic contexts per year (2016–2025)

The pattern in Fig. 2 suggests an early developmental stage with minimal publications in 2016, a modest rise in 2017, and a temporary dip in 2018 that may reflect sporadic early research activity. The period from 2019 to 2021 shows more consistent growth, indicating increasing institutional recognition of Islamic Entrepreneurship Education as a relevant scholarly domain. A marked surge occurs in 2022, when the number of publications rises sharply, aligning with heightened post-pandemic research momentum and intensified global discourse on sustainable recovery in which value-based entrepreneurship is frequently positioned as a mechanism for ethical economic revitalization [29]. Subsequent output in 2023 and 2024 remains high but stabilizes slightly, which may reflect thematic consolidation and the emergence of more specialized subfields, including Islamic fintech entrepreneurship and green business models in Islamic contexts [30]. While the figure indicates a lower count in 2025, this pattern is more plausibly interpreted as a shift toward deeper, more empirical and theory-driven contributions rather than a declining interest in the area, particularly given the continued salience of SDGs, digital platforms, and resilience agendas in entrepreneurship education [31]; [32]. Keyword mapping using VOSviewer further clarifies the intellectual structure of the field by revealing four major thematic clusters that represent distinct but related streams of research. Fig. 3 visualizes these clusters and shows how Islamic values intersect with entrepreneurship education across technological-pedagogical concerns, intention and labor-market dynamics, leadership and human development, and broader cultural-normative dimensions [33].

Fig 3. Thematic clusters of keywords in Islamic Entrepreneurship Education based on VOSviewer mapping

The first cluster emphasizes entrepreneurship education within technically oriented learning environments, reflected in keywords such as entrepreneurship education, engineering education, innovation, and student. This stream highlights pedagogical designs that embed entrepreneurship into applied and STEM-related curricula, with attention to product development, innovation systems, and technology-enabled learning. Within Islamic contexts, this cluster frequently addresses how ethical commitments can be infused into innovation processes so that technical competence is developed alongside trustworthiness and social responsibility [34]. The second cluster centers on entrepreneurial intention, self-efficacy, gender, and employment and is often informed by established behavioral models such as the Theory of Planned Behavior. In Islamic settings, intention is commonly framed as intertwined with faith-based commitments, linking perceived capability and social norms to values such as amanah and istiqamah, while also opening a growing research space for gender-sensitive analyses and women's entrepreneurial participation [35]. The third cluster focuses on leadership, human factors, psychology, and social change, positioning entrepreneurship as a vehicle for societal transformation rather than only individual economic gain, and emphasizing ethical leadership and community welfare as integral outcomes of entrepreneurship education in Islamic contexts [36]. The fourth cluster highlights entrepreneurial culture, subjective norms, public attitude, and behavioral control, indicating that entrepreneurial outcomes are shaped not only by curriculum and individual intention but also by community-level norms and moral codes associated with Sharia-informed ethical expectations; this stream suggests that long-term sustainability and engagement depend on collective trust and shared moral orientation [37].

International collaboration patterns indicate that Islamic Entrepreneurship Education is increasingly embedded in cross-national research networks that connect developed and developing countries. Fig. 4 shows distinct collaboration clusters involving countries such as the United States, China, Germany, Spain, India, Malaysia, and others, reflecting that entrepreneurship research anchored in Islamic values is being engaged as a lens for addressing broader global challenges related to economic transformation, digitalization, and sustainable development [38]; [39].
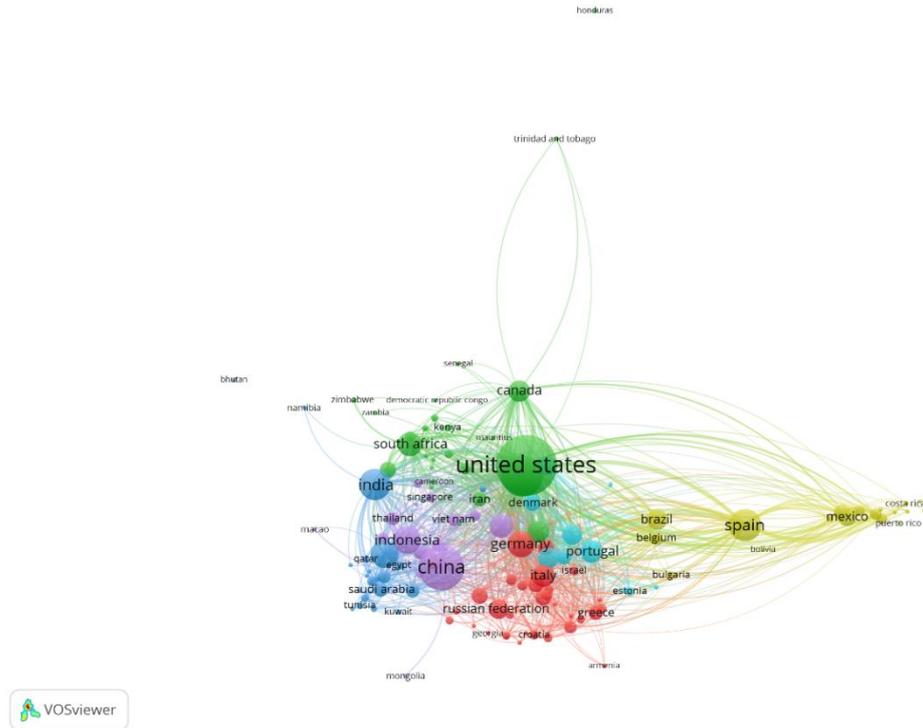
Fig 4. Global research collaboration clusters in entrepreneurship education.

The collaboration structure suggests that North American and European hubs frequently function as connectors across regions, while Asian and Muslim-majority countries contribute substantively to value-based entrepreneurship themes, including Sharia-informed curricula and ecosystem development. At the same time, emerging participation from Latin American and African contexts highlights the relevance of inclusive entrepreneurship models and community empowerment agendas, often supported through partnerships that facilitate knowledge transfer and contextual adaptation [32], [40], [41].

Overlay visualization provides a temporal view of how keyword emphases evolve over time, enabling identification of foundational concepts, transitional themes, and recent emerging fronts. Fig. 5 suggests that earlier work emphasized foundational pedagogical terms such as entrepreneurship education, students, higher education, and engineering education, which reflects the field's initial consolidation as a university-based domain. The transitional period highlights growing prominence of creativity, technology transfer, curriculum, and innovation, indicating a shift toward applied and interdisciplinary models that connect entrepreneurship education to technology and problem-solving approaches [42], [43]. More recent terms emphasize entrepreneurial intention, sustainability, self-efficacy, digital skills, and ecosystems, which signals a pivot toward digital entrepreneurship, sustainability-oriented learning, and ecosystem perspectives that examine how entrepreneurship education connects to societal outcomes and policy environments collaboration [44]; [39].

Taken together, the publication trend, keyword clusters, collaboration networks, and temporal overlays indicate that Islamic entrepreneurship education is expanding and diversifying, but the intellectual structure remains uneven across themes, with visible fragmentation between streams focused on ethics and values, those focused on behavioral intentions, and those focused on digitalization and ecosystem development. These bibliometric patterns provide the empirical basis for the discussion below, which interprets what the mapped structures imply for management and organization theory and outlines a research agenda that moves from mapping to mechanism.
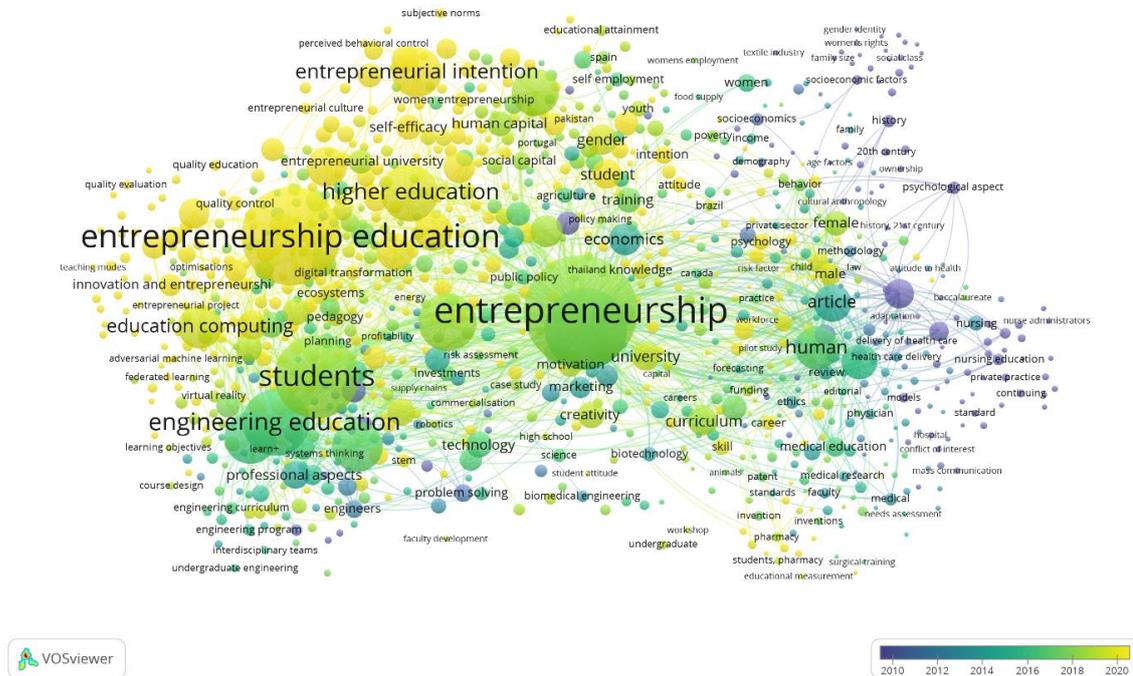
Fig. 5. Overlay visualization of keyword evolution in entrepreneurship education research

4. Discussion

This study advances the conversation on Islamic entrepreneurship education by repositioning it from a curriculum-centric topic to a phenomenon that is theoretically consequential for management and organization studies. Islamic entrepreneurship education can be conceptualized as a form of institutional work that shapes moral-economic logics, produces and stabilizes value-laden practices, and helps educational organizations cultivate legitimacy in contested environments where market rationalities, religious authority, and sustainability imperatives intersect. By linking the education domain to established management lenses on institutional entrepreneurship and institutional change [45], [46], [47]. The paper clarifies why Islamic entrepreneurship education is not merely an educational technique but a governance-relevant mechanism through which organizations and fields negotiate what "legitimate" entrepreneurship should look like.

Beyond reframing, the study converts bibliometric mapping into theory building rather than treating it as a descriptive endpoint. The thematic clusters identified in the Results can be interpreted as coordinated but partially competing streams that surface tensions and unresolved theoretical linkages. A key tension emerges between digitalization-oriented work that foregrounds scalability and innovation logics and values- and ethics-centered work that foregrounds moral authority and boundary setting, raising the question of how legitimacy is constructed when entrepreneurship is simultaneously "modernized" and "moralized." In parallel, intention-focused studies, often grounded in the Theory of Planned Behavior [48], can be strengthened by integrating institutional supports and structural constraints that condition whether intentions translate into entrepreneurial action, including ecosystem features such as incubators, policy incentives, religious-organizational governance, and access to digital infrastructure. These cross-stream frictions provide a disciplined basis for specifying missing links and articulating a research agenda that is empirically actionable rather than merely descriptive, consistent with the expectation that review-oriented contributions should generate arguments that redirect and structure future research [49].

The four-cluster structure also suggests that Islamic entrepreneurship education should be theorized as an organizing process rather than only a curriculum package. The technology-oriented pedagogy stream highlights competence formation and scalable delivery, but it often under-specifies how Islamic ethical commitments are enacted and enforced in everyday organizing. The intention and self-efficacy stream offer strong micro-foundations but tend to treat context as a background condition rather than a variable that shapes mechanisms of translation from intention to action. The leadership and human-centered stream implies that values are institutionalized through authority relations, role modeling, and ethical climate creation, making leadership a central mechanism of values transmission. The culture and behavioral-normative stream indicate that shared norms and moral evaluation frameworks are not peripheral but constitute the social infrastructure that determines whether entrepreneurship is seen as legitimate, desirable, and sustainable over time. Together, these patterns motivate theory development that connect micro-level motivational processes to meso-level organizational practices and macro-level field logics, rather than leaving these levels analytically disconnected.

Importantly, the mapped structures imply boundary conditions that should be treated explicitly in future research. The legitimacy dynamics of Islamic entrepreneurship education are likely to differ in Muslim-majority versus Muslim-minority settings, where normative expectations and institutional supports vary markedly. Similar differences can be expected between pesantren-based ecosystems and university-based ecosystems, which differ in authority structures, community embeddedness, pedagogical traditions, and pathways to entrepreneurial action. The Global South context further raises issues of resource constraints, institutional voids, and uneven digital readiness, suggesting that digital entrepreneurship and sustainability agendas may be implemented through distinctive hybrid arrangements where religious authority, community norms, and market pressures jointly shape adoption and outcomes.

To strengthen the evidentiary force of the bibliometric contribution, the reporting of Results should be presented as an evidence trail rather than interpretive narration, with transparent documentation of sample size, publication and citation distributions, and identifiable field leaders such as the most productive journals, most cited documents, most influential authors, and leading countries or institutions. Robustness can be enhanced by comparing patterns derived from a Scopus-only dataset against the multi-database dataset to clarify which findings are stable and which are database-sensitive. Mapping choices that can shape cluster formation should be explicitly reported, including threshold rules and counting methods, because these parameters materially affect network density, cluster granularity, and interpretability; this aligns with best-practice guidance that emphasizes replicability and discourages treating visualization as self-validating evidence [22], [23].

This discussion also clarifies the article's position depending on the intended AOM outlet without requiring changes to the core dataset. When framed for Academy of Management Learning & Education, the contribution can be articulated in terms of learning mechanisms, specifying how Islamic work ethics, intention formation, and transdisciplinary learning operate as processes shaping entrepreneurial competence, identity, and action, and what this implies for pedagogy, curriculum architecture, and outcome assessment in management education contexts. When framed for Academy of Management Perspectives, the contribution can be foregrounded as a practice- and policy-relevant argument about how educational institutions and policymakers can build ethical, digitally capable, sustainability-oriented entrepreneurial ecosystems while acknowledging trade-offs and implementation constraints in real settings. In both cases, the map-to-mechanism move supports a tighter logic from evidence to implication, which is necessary for review-based contributions to be evaluated as impactful rather than merely comprehensive.

Finally, the reference strategy should be tightened to meet AOM reviewer expectations by anchoring core claims in high-credibility management and organization research and using more local or niche sources primarily for contextual texture rather than foundational arguments. This matters because the central claim is theoretical, namely that Islamic entrepreneurship education functions as a legitimacy- and values-producing mechanism in organizations and ecosystems. For this claim to persuade, supporting evidence should draw primarily on established management and ethics outlets,

supplemented by context-specific sources to preserve empirical richness. Where Islamic work ethic is mobilized, for example, the argument is strengthened by relying on recognized ethics scholarship such as [50] and integrative discussions of Islamic work ethic such as Ali and Al-Owaihan [51], while maintaining conceptual consistency with the institutional and values-based organization literature used to frame the management contribution.

5. Conclusion

The findings of this study indicate that Islamic entrepreneurship education has moved beyond a peripheral niche and is increasingly positioned at the intersection of ethics, sustainability, and digital transformation. The bibliometric patterns presented in the Results, including publication growth, keyword clustering, international collaboration, and temporal overlays, show a field that is expanding and diversifying, yet still marked by uneven theoretical consolidation and fragmented thematic development. In particular, the mapping suggests that research streams related to digitalization and innovation-oriented pedagogy, intention and self-efficacy, leadership and human development, and culture-normative dimensions often evolve in parallel rather than being integrated into a coherent explanatory framework. This fragmentation signals a persistent gap between value-based aspirations associated with Islamic education and the institutional and ecosystem conditions required for entrepreneurial learning to translate into scalable, sustainable practice in digitally mediated environments. Building on these patterns, this study contributes by reframing Islamic entrepreneurship education as theoretically consequential for management and organization research, not only for curriculum design. Conceptually, Islamic entrepreneurship education can be understood as an organizing and institutional process through which educational actors construct moral-economic logics, enact values in practice, and negotiate legitimacy for entrepreneurship that is simultaneously market-relevant and ethically bounded. The integrative lens linking Islamic Work Ethics, intention-based perspectives such as the Theory of Planned Behavior, and transdisciplinary learning is proposed as an analytical foundation for connecting micro-level motivational dynamics to meso-level organizational arrangements and macro-level field conditions. In this way, the study advances a "map-to-mechanism" interpretation in which bibliometric clusters are treated as evidence of underlying tensions and missing links rather than as descriptive categories alone.

Future research should therefore shift from predominantly descriptive and single-context studies toward designs that test mechanisms, boundary conditions, and outcomes across settings. Comparative work across Muslim-majority and Muslim-minority contexts, and across pesantren-based versus university-based ecosystems, is particularly important to clarify how legitimacy, authority, and institutional supports shape entrepreneurial learning processes. Longitudinal and multi-level studies are also needed to examine how intentions, ethical orientations, and competencies develop over time and under what ecosystem conditions they translate into entrepreneurial action. Finally, policy- and practice-oriented research should explore how digital tools, sustainable finance, and green entrepreneurship models can be embedded into Islamic entrepreneurship curricula without weakening the ethical commitments that define the domain. Pursuing this agenda would strengthen the field's theoretical coherence, improve its empirical credibility, and enhance its capacity to contribute to sustainability goals through entrepreneurs who combine ethical integrity, resilience, and social innovation.

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