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RESEARCH

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Entrepreneurial Leadership As A Catalyst For Human Capital Development: A Systematic Literature Review

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Abstract

Human capital development has become a strategic priority for organizations, including healthcare institutions, facing rapid digital transformation, workforce shortages, and increasing demands for innovation and service quality. Entrepreneurial leadership has been recognized as a leadership approach capable of fostering workforce competencies, talent retention, and organizational innovation. This systematic literature review aims to synthesize empirical and theoretical evidence regarding the role of entrepreneurial leadership in human capital development. Following PRISMA 2020 guidelines, literature was identified from Scopus, ScienceDirect, SpringerLink, Emerald Insight, Google Scholar, and complementary citation chaining procedures. From 501 identified records, 50 highly relevant studies were included for thematic synthesis. The findings reveal that entrepreneurial leadership enhances workforce skills through continuous learning, coaching, and competency development; improves talent retention through affective commitment and supportive organizational climates; and strengthens innovation performance through intellectual capital and dynamic capabilities. Digital transformation, Industry 4.0, artificial intelligence, and sustainability frameworks emerged as important contextual factors influencing leadership effectiveness. In healthcare organizations, these findings suggest that entrepreneurial leadership can support workforce resilience, digital competency development, service innovation, and sustainable healthcare performance. Despite conceptual and methodological limitations within the literature, entrepreneurial leadership remains a promising approach for strengthening human capital development in increasingly complex organizational environments.

Keywords: Entrepreneurial Leadership, Human Capital Development, Skills Enhancement, Talent Retention, Innovation Performance

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1. INTRODUCTION

Organizational survival in today's volatile, technology-driven markets increasingly depends on the quality of human capital and leaders' capacity to develop, retain, and harness it for innovation. This imperative is particularly acute in the health sector, where chronic workforce shortages, rapid digital health transformation, and escalating demands for patient safety and service quality place extraordinary pressure on healthcare organizations to cultivate, retain, and continuously upskill their human resources (World Health Organization, 2022). Entrepreneurial leadership, characterized by proactive opportunity recognition, risk-taking, and an innovation orientation, has been positioned as a strategic lever for achieving these imperatives across industries, including healthcare (Hoang et al., 2025; Norena-Chavez & Thalassinou, 2023). Unlike conventional leadership paradigms that prioritize structural stability, entrepreneurial leadership embraces ambiguity and dynamism, enabling organizations, from hospitals and primary care facilities to public health agencies, to adapt continuously to external disruptions (C. M. Clark et al., 2019; Joel & Oguanobi, 2024).

Within healthcare organizations, human capital represents the primary driver of service quality, patient safety, organizational resilience, and innovation. Healthcare institutions worldwide face persistent challenges related to workforce shortages, employee burnout, talent retention, digital health transformation, and increasing demands for sustainable healthcare delivery. Consequently, leadership approaches that foster innovation, adaptability, and continuous competency development have become increasingly important. Entrepreneurial leadership offers a promising framework for addressing these challenges by promoting opportunity recognition, innovation-oriented behavior, and workforce empowerment within healthcare settings.

The empirical foundation for the impact of entrepreneurial leadership on organizational outcomes has grown substantially over the past decade. Studies report positive associations between entrepreneurial leadership and innovation performance (Sai et al., 2024), employee creativity (Ageli et al., 2025), talent retention (D. R. Clark & Bradley, 2024; Qibtiyah & Salsabil, 2023), and organizational resilience (Simić et al., 2020). In health management contexts, these outcomes are critical: innovation drives the adoption of digital health technologies and evidence-based care models, while talent retention directly affects service continuity and patient outcomes in resource-constrained health systems. Concurrently, evolving socioeconomic contexts including the Fourth Industrial Revolution (Industry 4.0), accelerated digital transformation in healthcare delivery, and heightened sustainability imperatives framed by Environmental, Social, and Governance (ESG) criteria and the United Nations Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-Being) have fundamentally reconfigured leadership demands in both corporate and health sector organizations (Banerjee & Sharma, 2024; Joaquim & Figueiredo, 2024; Nurani et al., 2024).

Despite this accumulating evidence, critical gaps persist. The literature remains fragmented across disciplinary silos, with inconsistent conceptualizations of both entrepreneurial leadership and human capital development (Harrison et al., 2021; Pauceanu et al., 2021). Mediating mechanisms, those organizational processes through which entrepreneurial leadership translates into tangible human capital outcomes, are incompletely theorized. Furthermore, the contextual moderators (e.g., digital maturity, cultural context, industry sector) that shape these relationships are insufficiently examined (Norena-Chavez & Thalassinou, 2023). Notably, the health sector, despite being among the most human-capital-intensive industries globally, remains underexplored in entrepreneurial leadership research, even as health organizations face unprecedented challenges in workforce planning, digital health integration, and health information management. These deficiencies hinder the accumulation of generalizable knowledge and limit evidence-based leadership development practice, particularly in health management settings where leadership quality directly influences patient care, health workforce well-being, and system sustainability.

To address these gaps, this systematic literature review (SLR) synthesizes interdisciplinary empirical and theoretical research on entrepreneurial leadership as a catalyst for human capital development across industries, with particular attention to the implications for health management and the health workforce. Specifically, this review pursues five objectives: (1) to evaluate current knowledge on entrepreneurial leadership's role in enhancing workforce skills, including those in healthcare settings; (2) to benchmark theoretical frameworks and measurement approaches; (3) to identify and synthesize mediating factors linking entrepreneurial leadership to talent retention and innovation; (4) to compare leadership effects within digital transformation and sustainability contexts, including digital health transformation; and (5) to identify methodological challenges and future research priorities relevant to both general management and health management scholarship.

This review adopts a resource-based view (RBV) and dynamic capability theory (DCT) as its primary theoretical lenses, providing a foundation for understanding how entrepreneurial leadership mobilizes intellectual capital components, human, relational, and structural, to foster sustainable organizational performance (Alshurideh et al., 2024; Norena-Chavez & Thalassinou, 2023). In the health sector, these frameworks are particularly relevant, as healthcare organizations must continually reconfigure clinical competencies, health information systems, and interprofessional networks to meet evolving epidemiological, technological, and regulatory demands. The findings contribute to a more coherent theoretical understanding of entrepreneurial leadership and provide actionable guidance for scholars, practitioners, and policymakers, including health managers and health workforce planners seeking evidence-based strategies for human capital development.

2. RESEARCH METHOD

This review adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure methodological transparency, reproducibility, and rigor (Page et al., 2021). The protocol encompasses database search, citation chaining, relevance scoring, quality assessment, and thematic synthesis.

The review protocol was designed prior to data collection to minimize selection bias. The central research question was: "How does entrepreneurial leadership catalyze human capital development specifically skills enhancement, talent retention, and innovation across different industries?" The review encompasses empirical and theoretical studies published in peer-reviewed journals and conference proceedings between 2016 and 2025, reflecting the period of intensified scholarly attention following foundational systematic reviews by Harrison et al. (2016) and Clark et al. (2019).

Inclusion criteria required studies to: (1) address entrepreneurial leadership as a primary or secondary construct; (2) examine at least one human capital outcome (skills, talent retention, innovation, or organizational performance); (3) employ rigorous empirical, quasi-experimental, case study, or systematic review methodology; (4) be published in English in a peer-reviewed outlet; and (5) be published between 2016 and 2025. Exclusion criteria eliminated: editorials, commentaries, and book chapters without original data; studies exclusively addressing other leadership typologies with no entrepreneurial leadership component; studies focusing solely on entrepreneurial firms without leadership analysis; and grey literature sources. No geographic restrictions were imposed to maximize the diversity of contextual evidence.

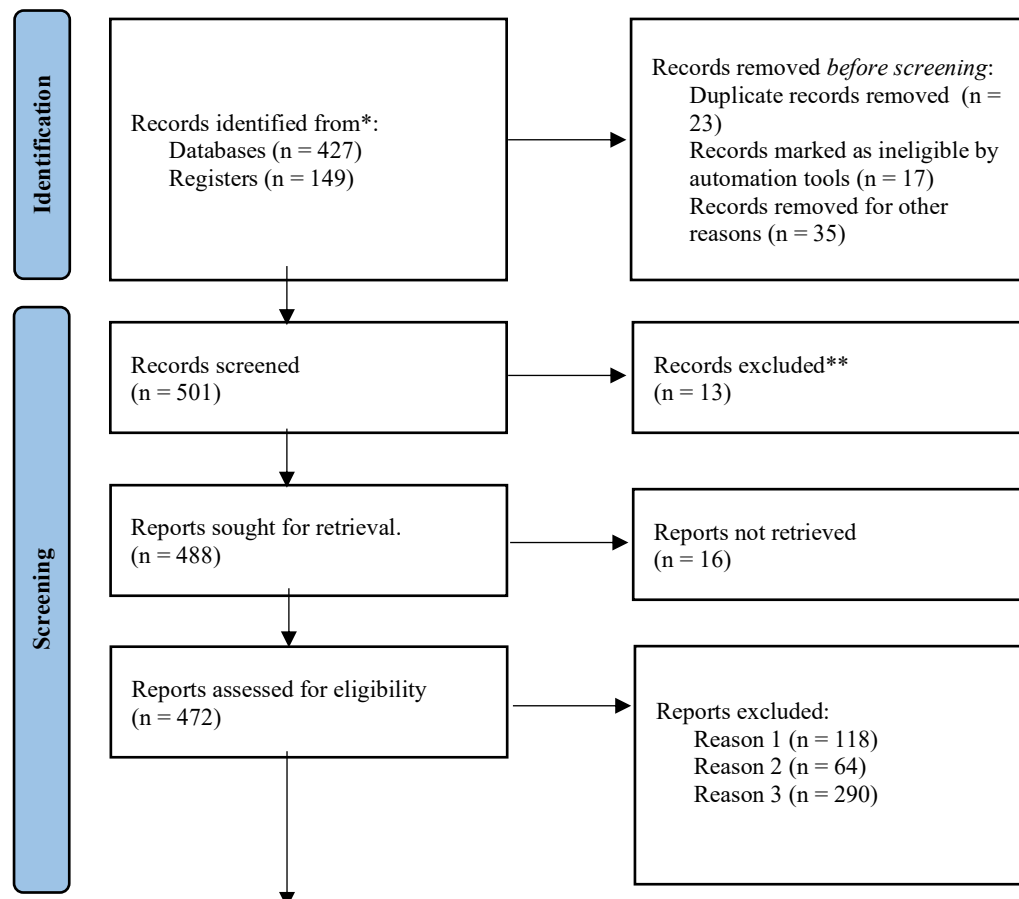
Literature searches were conducted using major academic databases, including Scopus, ScienceDirect, SpringerLink, Emerald Insight, and Google Scholar. SciSpace was used only as a supplementary discovery and citation-mapping platform to facilitate article screening and citation chaining. Boolean operators (AND, OR, NOT) and MeSH-equivalent subject headings

were applied where available. Truncation and wildcard operators were used to capture terminological variants (e.g., "entrepreneurial lead", "talent manag", "innovat"). Following database retrieval of 414 papers, backward citation chaining (examining reference lists of core papers) and forward citation chaining (identifying papers citing core papers) identified 87 additional records, yielding a total candidate pool of 501 papers.

Titles, abstracts, and keywords of all 501 records were screened against eligibility criteria, excluding 29 records at this stage and retaining 472 for further assessment. All 472 records underwent full-text relevance scoring using a multi-dimensional algorithm evaluating: (1) conceptual alignment with entrepreneurial leadership; (2) human capital outcome specificity; (3) methodological quality; (4) theoretical grounding; and (5) contextual relevance (digital/sustainability contexts). Studies scoring in the top decile were classified as highly relevant ($n = 50$). Methodological quality of included studies was assessed using the Mixed Methods Appraisal Tool (MMAT) for empirical studies and the DARE criteria for systematic reviews. Risk of bias was evaluated across dimensions of internal validity, measurement reliability, sampling representativeness, and analytical rigor.

Data were extracted from the 50 highly relevant studies using a structured extraction framework capturing: study identification (author, year, country); methodology; theoretical framework; industry context; sample characteristics; mediating and moderating variables; key findings; and limitations. Given the heterogeneity of methodologies and outcomes across studies, meta-analysis was not feasible. Instead, thematic synthesis was employed, involving: (1) line-by-line coding of key findings; (2) development of descriptive themes; and (3) generation of analytical themes representing interpretive constructs beyond individual studies (Thomas & Harden, 2008). Chronological analysis documented the temporal evolution of research themes. Agreement and divergence analysis systematically compared convergent and contradictory evidence across studies.

3. RESULTS AND DISCUSSION



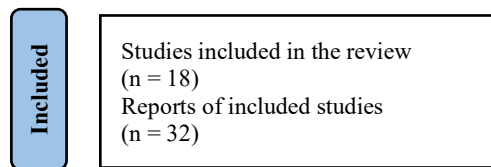


Figure 1. PRISMA Flow Diagram

The 50 highly relevant studies exhibit broad temporal, geographic, and methodological diversity. In terms of publication chronology, 2 studies were published during 2016–2017, 3 during 2018–2020, 7 during 2021–2022, 10 during 2023, 14 during 2024, and 14 during 2025, indicating an accelerating trajectory of scholarly output. Geographically, studies represent 24 countries across Asia (including Indonesia, Malaysia, Saudi Arabia, and Vietnam), Europe (including Greece, Croatia, and Spain), Sub-Saharan Africa (Ethiopia), and the Middle East, with 6 multi-country comparative studies.

Methodologically, the corpus encompasses 18 systematic literature reviews (including bibliometric analyses), 16 quantitative studies (employing structural equation modeling, DEMATEL, fuzzy TOPSIS, and multivariate regression), 8 qualitative studies (case studies, thematic analysis, grounded theory), 5 mixed-methods designs, and 3 conceptual/framework papers. Industry contexts span SMEs (n=15), startups (n=10), high-technology sectors (n=8), banking and financial services (n=5), manufacturing/Industry 4.0 (n=6), hospitality (n=2), Islamic insurance (n=1), and cross-sectoral studies (n=3). Theoretical frameworks most frequently employed include resource-based view (RBV, n=14), dynamic capability theory (DCT, n=12), social learning theory (n=5), structural equation modeling frameworks (n=10), and positive organizational behavior theory (n=4).

Table 1. Characteristics of Included Studies (n = 50).

Author(s)	Year	Method	Sector	Main Focus
Harrison et al.	2021	SLR	Cross-sector	Entrepreneurial leadership concept
Clark et al.	2019	SLR	Cross-sector	EL conceptual framework
Rae	2017	Conceptual	Organizations	Sustainable entrepreneurial leadership
Simić et al.	2020	Quantitative	SMEs	Human capital mediation
Pauceanu et al.	2021	SLR	Cross-sector	EL and sustainable development
Aparisi-Torrijo & Ribes-Ginera	2022	Bibliometric	Cross-sector	EL research mapping
Somborac et al.	2022	Empirical	SMEs	Entrepreneurial competencies
Noreña-Chávez & Thalassinós	2023	Quantitative	Technology	Intellectual capital mediation
Youssef	2023	Quantitative	Banking	Strategic flexibility
Qibtiyah & Salsabil	2023	Quantitative	Startup	Talent retention
Sai et al.	2024	SLR	SMEs	Innovation performance
Hoang et al.	2025	SLR	Cross-sector	EL research agenda
Ageli et al.	2025	Quantitative	Banking	Creativity and innovation climate

Banerjee & Sharma	2024	SLR	Industry 4.0	Talent management
Joaquim & Figueiredo	2024	Conference study	Digital organizations	Digital entrepreneurial leadership
Hruška et al.	2024	Conceptual	Industry 4.0	Digital leadership competencies
Setyanti et al.	2025	Review	Digital workplace	Talent retention and upskilling
Pasigai et al.	2025	SLR	Cross-sector	Human capital in the ESG era
Nurani et al.	2024	SLR	Organizations	Competency-based HRM
Handayani et al.	2024	SLR	Industry 4.0	HR transformation
Aziz et al.	2025	Quantitative	Entrepreneurial firms	AI and intellectual capital
Pennetta et al.	2024	SLR	Entrepreneurship	Entrepreneurial ability model
Mintardjo et al.	2024	Review	Future workforce	Entrepreneurial future skills
Saputro & Santoso	2025	SLR	Multi-sector	Digital leadership
Clark & Bradley	2024	Conceptual	Entrepreneurial firms	Team leadership
Joel & Oguanobi	2024	Review	SMEs	Entrepreneurial leadership lessons
Alshurideh et al.	2024	Quantitative	Islamic insurance	Sustainable innovation
Ataei et al.	2024	Quantitative	Education	Opportunity recognition
Chaudhuri et al.	2023	Quantitative	Ecosystem	Human capital and innovation
Moektiwibowo & Hendayana	2025	Conceptual	Organizations	RBV and dynamic capabilities
Rivera-Valderrama & Cieza-Mostacero	2025	SLR	Workforce	Leadership strategies
Vieira & Gomes	2024	SLR	Talent management	Generation Z workforce
Woldesenbet Beta & Gezahegn	2025	Quantitative	MSMEs	EL and performance
Yan et al.	2024	Quantitative	Green innovation	Green talent management
Sakher Alnajdawi et al.	2019	Quantitative	Organizations	Knowledge management
Khairina	2022	Quantitative	Employees	Organizational support
Priyanka Ramesh	2025	DEMATEL	Startup	Talent acquisition challenges

Rezaei	2025	Review	Knowledge management	AI implementation
Gagan Deep	2023	Review	Organizations	Digital transformation culture
Bouwman et al.	2022	SLR	Employment	Digital transformation skills
Kapur & Tyagi	2022	Quantitative	IT sector	Human capital and retention
Safi et al.	2024	Literature review + interviews	Workforce Digital Transformation	Digital readiness and digital competencies are critical determinants of successful organizational transformation and workforce capability enhancement.
Park & Kim	2025	Systematic Literature Review (PRISMA 2020)	Entrepreneurship Education / Digital Transformation	Entrepreneurial competencies in the digital era integrate creativity, critical thinking, digital literacy, AI literacy, adaptability, and self-directed learning.
Wang et al.	2024	Quantitative	Organizational Innovation	Innovative organizational climate positively influences employee innovation and organizational adaptability.
Gonzalez-Varona et al.	2024	Qualitative	SMEs and Digital Transformation	Organizational competencies facilitate digital transformation and workforce readiness.
Yan et al.	2024	Quantitative	Sustainability & Talent Management	Entrepreneurial leadership supports innovative work behavior through talent management practices.
Rezaei	2025	Review	Knowledge Management & AI	Implementing artificial intelligence requires organizational learning capability and knowledge management readiness.
Spanos et al.	2024	Scoping Review	Healthcare Leadership	Future healthcare leaders require adaptive leadership, innovation capability, and workforce development competencies.
McLoughlin et al.	2024	Systematic Review	Healthcare Workforce	Workforce development, recruitment, and retention are essential for healthcare sustainability.
Hu et al.	2024	Mixed-Methods Systematic Review	Healthcare Management	Leadership coaching strengthens managerial competencies and human capital development among healthcare managers.

Table 1 presents the characteristics of the 50 studies included in this systematic literature review. The studies demonstrate substantial diversity in publication years, geographical coverage, methodological approaches, and sectoral contexts. Most studies were published between 2023 and 2025, indicating growing scholarly interest in entrepreneurial leadership as a mechanism for strengthening human capital development in response to digital transformation, workforce challenges, and sustainability demands.

Table 2. Major Themes Identified in the Review

Theme	Frequency	Summary of Evidence
Entrepreneurial Leadership and Innovation Capability	18	EL enhances innovation through intellectual capital, strategic flexibility, knowledge sharing, and opportunity recognition.
Human Capital Development and Workforce Competencies	17	EL improves workforce competencies through coaching, training, continuous learning, digital literacy, and the development of adaptive skills.
Talent Retention and Employee Engagement	13	EL strengthens affective commitment, organizational support, empowerment, and employee retention.
Entrepreneurial Leadership in SMEs, Startups, and Healthcare Organizations	10	EL supports adaptability, resilience, innovation, and workforce development in resource-constrained environments.
Digital Transformation, Industry 4.0, and AI-enabled Leadership	12	EL facilitates digital transformation, AI adoption, digital competencies, and organizational agility.
Sustainability, ESG, and Future Leadership Development	10	EL contributes to sustainable innovation, ESG integration, SDG alignment, and future workforce readiness.

Table 2 summarizes the six major themes identified through thematic synthesis. The most frequently reported themes were entrepreneurial leadership and innovation capability, human capital development and workforce competencies, and talent retention and employee engagement. These themes collectively demonstrate that entrepreneurial leadership contributes not only to organizational innovation but also to the development and sustainability of human resources.

The emergence of digital transformation, Industry 4.0, artificial intelligence, and sustainability-related themes reflects the evolving nature of entrepreneurial leadership research. Recent studies increasingly emphasize the need for leaders to develop digital competencies, promote continuous learning, and support organizational adaptation in dynamic environments. In healthcare settings, these competencies are particularly relevant as organizations seek to strengthen workforce capability, service innovation, and resilience in response to ongoing technological and operational changes.

Entrepreneurial Leadership and Innovation Performance

The most prevalent theme (18/50 studies) addresses entrepreneurial leadership's direct and mediated effects on innovation outcomes. Across diverse methodological approaches, entrepreneurial leadership consistently predicts enhanced innovation performance—encompassing innovation speed, quality, and sustainability. Noreña-Chávez and Thalassinou (2023) demonstrated in the IT sector that entrepreneurial leadership indirectly influences innovation, fully mediated by intellectual capital components (human, relational, and structural capital). Nomological network positioning intellectual capital as the primary vehicle through which entrepreneurial leadership activates innovation capacity.

Youssef (2023) further elaborated on this pathway in the banking sector, revealing that strategic flexibility mediates the relationship between entrepreneurial leadership and both the speed and quality of innovation. In hospitality contexts, market-sensing capabilities and knowledge acquisition emerged as critical mediating mechanisms.

Notably, a minority of studies identified contextual contingencies complicating the EL innovation nexus. Beta (2025) found that in resource-constrained Ethiopian micro, small, and medium enterprises (MSMEs), certain entrepreneurial leadership attributes particularly risk-taking and long-term vision exhibited negative or null effects on firm performance, attributable to institutional voids and environmental uncertainty. Beyond business and entrepreneurial contexts, the relationship between entrepreneurial leadership and innovation performance is also highly relevant in healthcare organizations. Healthcare institutions increasingly depend on innovation to improve service quality, patient safety, operational efficiency, and responsiveness to changing health needs. Entrepreneurial leaders can foster a culture that encourages creative problem-solving, interdisciplinary collaboration, and continuous improvement among healthcare professionals (Hu et al., 2024). Consequently, innovation-oriented leadership may contribute not only to organizational competitiveness but also to healthcare service innovation and sustainable health system performance.

Human Capital Development and Skills Enhancement

Seventeen studies addressed entrepreneurial leadership's facilitative role in human capital development. Rivera-Valderrama and Cieza-Mostacero (2025) identified participatory, formative, and coaching leadership strategies as primary drivers of competency development and workforce motivation. Their systematic review highlighted feedback quality and autonomy support as critical mechanisms through which entrepreneurial leadership translates into measurable competency gains. Nurani et al. (2024) extended this analysis to digital-era organizations, emphasizing that entrepreneurial leadership must integrate digital competency development as a core human capital priority, operationalized through SDG-aligned competency tracking and measurement of training outcomes. In Industry 4.0 contexts, Banerjee and Sharma (2024) documented the role of entrepreneurial leadership in facilitating agile HRM transformations, including continuous upskilling and reskilling through digital learning platforms. Setyanti et al. (2025) reinforced this, demonstrating that digital-age human capital strategies mediated by entrepreneurial leadership produced measurable improvements in talent retention rates and upskilling effectiveness in global digital workplaces. Simić et al. (2020) provided foundational evidence from SMEs in Serbia's transitional economy, establishing that human capital developed through entrepreneurial leadership practices fully mediated the relationship between leadership and SME performance.

The implications of these findings extend significantly to healthcare workforce development. Healthcare professionals are required to continuously update clinical knowledge, technological competencies, and collaborative skills in response to evolving healthcare demands (Park & Kim, 2025). Entrepreneurial leadership may support this process by encouraging lifelong learning, professional empowerment, knowledge sharing, and adaptive problem-solving. Such leadership practices are increasingly important as healthcare organizations implement digital technologies and seek to strengthen workforce resilience in complex service environments. A recurring finding concerns generational diversity as a moderating factor. Mintardjo et al. (2024) identified distinct competency clusters required for future industries, including adaptive resilience, creative problem-solving, and sustainable innovation orientation, reflecting differential expectations across generational cohorts. Pennetta et al. (2024) developed the Entrepreneurial Ability Model, providing a structured taxonomy of

entrepreneurial skills, competencies, and capabilities that entrepreneurial leadership should cultivate offering valuable operationalization for both research and practice.

Talent Retention and Employee Engagement

Talent retention emerged as a critical human capital outcome in 13 studies, with entrepreneurial leadership exhibiting predominantly positive yet context-dependent effects. Qibtiyah and Salsabil (2023) demonstrated in Indonesian startups that entrepreneurial leadership significantly reduced employee turnover intentions, with affective commitment functioning as the primary mediating mechanism. Higher affective commitment engendered through entrepreneurial leaders' vision-sharing, empowerment practices, and innovation-supportive climates translated into reduced withdrawal intentions and enhanced organizational citizenship behaviors.

Clark and Bradley (2024) synthesized talent management best practices within entrepreneurial firm contexts, identifying employee recognition, developmental opportunities, and perceived organizational support as retention-critical factors moderated by entrepreneurial leadership quality. Where entrepreneurial orientation-driven human capital development mediated the relationship between leadership and retention, these studies converge on a theoretical model in which entrepreneurial leadership operates through intrinsic motivation and identity-based attachment to reduce attrition (Safi et al., 2024).

Digital Transformation and Industry 4.0 Leadership

Twelve studies specifically examined entrepreneurial leadership within digital transformation and Industry 4.0 contexts, representing a significant emergent research stream. Hruška et al. (2024) identified digital fluency, agility, and collaborative intelligence as the core competency additions required of entrepreneurial leaders navigating Industry 4.0 disruptions. Handayani et al. (2024) documented the facilitative role of entrepreneurial leadership in human resource transformation initiatives that accompany Industry 4.0 adoption, including training program design and the development of an innovative organizational culture.

Saputro and Santoso (2025) synthesized evidence on digital leadership conceptualized as an extension of entrepreneurial leadership across Asian organizational contexts, identifying data-driven decision-making and digital culture-building as primary mechanisms for enhancing innovation. Joaquim and Figueiredo (2024) integrated ESG and SDG frameworks with entrepreneurial leadership development, arguing that sustainable digital leadership requires competencies spanning technological fluency, ethical AI governance, and sustainability-aligned talent strategies. Pasigai et al. (2025) human capital management review explicitly positioned entrepreneurial leadership as central to navigating the simultaneous demands of digital transformation and ESG accountability.

Within healthcare organizations, digital transformation increasingly involves adopting electronic health records, telemedicine platforms, artificial intelligence applications, and data-driven clinical decision support systems. Entrepreneurial leadership can facilitate the successful implementation of these technologies by encouraging innovation, continuous learning, and organizational adaptability (Kim et al., 2024). As a result, entrepreneurial leadership may play an important role in improving digital readiness among healthcare professionals while supporting sustainable healthcare transformation.

Chronological Development of the Field

The intellectual evolution of entrepreneurial leadership research across the review period exhibits a clear progressive trajectory (Table 3). The foundational period (2016–2017) was characterized by definitional consolidation efforts, with Harrison et al. (2021) and Rae (2017) contributing systematic reviews that established core attributes (vision, risk-taking, creativity, opportunity recognition) and linked entrepreneurial leadership to sustainable organizational

development. The 2018–2020 period saw increased theoretical model development, with empirical validation efforts in SME and startup contexts (Simić et al., 2020) and growing attention to mediating variables, including employee creativity and knowledge sharing.

The 2021–2022 expansion incorporated talent management imperatives (Pauceanu et al., 2021), bibliometric mapping (Aparisi-Torrijo & Ribes-Ginera, 2022), and early attention to digital competency development in the post-COVID organizational landscape (Somborac et al., 2022). The 2023 inflection point witnessed deepened investigation of mediating mechanisms particularly intellectual capital components (Noreña-Chavez & Thalassinou, 2023), strategic flexibility (Youssef, 2023), and innovation-oriented climate (Ageli et al., 2025) alongside increased methodological sophistication through SEM and multi-source data designs. The 2024–2025 period represents the current frontier, characterized by integration of digital transformation, ESG, AI, and sustainability frameworks with entrepreneurial leadership scholarship, signaling a paradigmatic expansion of the field's theoretical and practical scope.

Table 3. Chronological Development of Entrepreneurial Leadership Research

Period	Research Direction	Key Contributions
2016–2017	Foundational concepts	Harrison et al.; Rae
2018–2020	Theoretical model emergence	Simić et al.
2021–2022	Talent management expansion	Pauceanu et al.; Aparisi-Torrijo et al.
2023	Mediating mechanisms	Noreña-Chávez; Youssef; Qibtiyah
2024	Digital transformation and sustainability	Banerjee & Sharma; Joaquim & Figueiredo
2025	AI-enabled leadership and future competencies	Aziz et al.; Pasigai et al.; Setyanti et al.

Table 3 demonstrates the evolution of entrepreneurial leadership research from foundational conceptual discussions toward broader applications involving digital transformation, sustainability, artificial intelligence, and workforce development. Early studies primarily focused on defining the characteristics of entrepreneurial leadership and their influence on organizational performance. More recent studies increasingly examine entrepreneurial leadership within the context of digital transformation, talent management, and sustainable organizational development. This progression highlights the growing relevance of entrepreneurial leadership for sectors facing rapid environmental change, including healthcare organizations undergoing digital health transformation and workforce modernization.

Agreement and Divergence Across Studies

The reviewed studies consistently indicate that entrepreneurial leadership contributes positively to innovation capability, workforce development, employee engagement, and organizational adaptability. Despite differences in research settings and methodologies, most studies support the argument that entrepreneurial leadership facilitates human capital development through empowerment, competency enhancement, and opportunity-oriented behavior (C. M. Clark et al., 2019; Pauceanu et al., 2021).

However, several differences emerge regarding the mechanisms through which entrepreneurial leadership influences organizational outcomes (Jia et al., 2021). Some studies identify direct effects on innovation and performance, whereas others emphasize the mediating role of intellectual capital, strategic flexibility, organizational climate, or employee commitment. Variations in industry context, organizational characteristics, and measurement

approaches may partially explain these inconsistencies (Woldesenbet Beta & Gezahegn, 2025). Furthermore, relatively limited empirical evidence currently exists within healthcare settings. Consequently, additional research is required to examine how entrepreneurial leadership influences healthcare workforce development, employee retention, service innovation, and digital transformation in healthcare organizations (Saputro & Santoso, 2025; Simić et al., 2020).

Entrepreneurial Leadership Implications for Healthcare Organizations

Although most studies included in this review were conducted in business, entrepreneurial, and SME contexts, the findings offer important implications for healthcare organizations. Healthcare systems worldwide face increasing challenges related to workforce shortages, employee burnout, technological disruption, and rising expectations for service quality. Addressing these challenges requires leadership approaches that encourage innovation, adaptability, collaboration, and continuous professional development (Mintardjo et al., 2024; Pennetta et al., 2024).

Entrepreneurial leadership provides a promising framework for strengthening healthcare human capital by promoting opportunity recognition, knowledge sharing, interdisciplinary collaboration, and workforce empowerment (Setyanti et al., 2025). Such leadership practices contribute to healthcare workforce resilience, employee engagement, digital competency development, and organizational innovation. Therefore, entrepreneurial leadership should be considered a strategic approach for supporting sustainable healthcare workforce development and improving organizational performance within contemporary healthcare systems (Alkan et al., 2024).

This systematic literature review synthesizes 50 highly relevant studies to demonstrate that entrepreneurial leadership is a multi-dimensional catalyst for human capital development across industries. The evidence base substantiates three primary pathways: (1) skills enhancement through participatory, coaching, and adaptive leadership styles that facilitate continuous learning and competency building; (2) talent retention through affective commitment mechanisms and supportive organizational climates that reduce turnover intentions; and (3) innovation performance through intellectual capital development and strategic flexibility that enhance dynamic organizational capabilities (Hoang et al., 2025; Norena-Chavez & Thalassinou, 2023).

The review also establishes that these pathways are not static but are increasingly shaped by digital transformation imperatives and sustainability demands (Spanos et al., 2024). Entrepreneurial leadership in Industry 4.0 contexts must incorporate digital fluency, data-driven HRM, agile organizational design, and ESG accountability into its operational repertoire. The integration of AI tools as amplifiers of entrepreneurial intellectual capital represents a particularly promising frontier, though one requiring careful attention to ethical governance dimensions (Aziz et al., 2025; Pasigai et al., 2025).

Theoretical Implications

The findings extend RBV and Dynamic Capability Theory by demonstrating that entrepreneurial leadership contributes to organizational performance through human capital enhancement, knowledge mobilization, and workforce adaptability. These mechanisms are particularly relevant in healthcare organizations where knowledge-intensive work, interdisciplinary collaboration, and continuous competency development are essential for maintaining service quality and organizational resilience.

The review establishes the multi-dimensional construct validity of entrepreneurial leadership, distinct from—yet complementary to—transformational, servant, and authentic leadership typologies. EL's distinguishing characteristics (proactive opportunity recognition, innovation-oriented risk tolerance, adaptive strategic vision) generate unique human capital

effects not fully captured by other leadership models (C. M. Clark et al., 2019; Pauceanu et al., 2021).

Practical Implications

For organizational leaders, investment in entrepreneurial leadership development programs should prioritize: role modeling of opportunity-seeking behaviors; intellectual capital creation through knowledge-sharing platforms and cross-functional collaboration; explicit cultivation of digital fluency and AI literacy among leadership cohorts; and creation of psychological safety environments that encourage innovation-oriented risk-taking without destabilizing HR stability. Leadership assessment frameworks should incorporate EL-specific competency profiles, including digital leadership dimensions.

For HR professionals, competency-based HRM systems aligned with EL principles should integrate SDG-aligned training curricula; generational diversity-responsive learning pathways; mentoring and coaching infrastructure that facilitates knowledge transfer; and retention-focused recognition and empowerment mechanisms. Talent management strategies in high-growth entrepreneurial contexts must explicitly address the tension between innovation-driven risk culture and stable, predictable employee experience expectations.

For healthcare organizations, entrepreneurial leadership may support workforce resilience, professional competency development, innovation in service delivery, and successful implementation of digital health technologies. The findings of this review have important implications for healthcare organizations facing workforce shortages, increasing service demands, and ongoing digital transformation. Entrepreneurial leadership may strengthen healthcare human capital through continuous professional development, employee engagement, knowledge sharing, and innovation-oriented work practices. Such leadership approaches can support workforce resilience, improve healthcare professional retention, and facilitate the implementation of digital health technologies. Entrepreneurial leadership is a valuable strategy for enhancing organizational adaptability and long-term sustainability within contemporary healthcare systems.

This review has several limitations. Although multiple databases and citation chaining procedures were used, some relevant studies may not have been identified. The predominance of cross-sectional research limits causal interpretation, while methodological heterogeneity prevents quantitative meta-analysis. In addition, relatively few studies specifically examined healthcare settings, highlighting the need for further sector-specific investigation.

Future research should employ longitudinal and cross-cultural designs to strengthen the understanding of the causal relationship between entrepreneurial leadership and human capital development. Further investigation is needed to examine the roles of intellectual capital, organizational culture, digital readiness, and employee empowerment as mechanisms linking entrepreneurial leadership to innovation, workforce competency development, and talent retention. Additional studies are particularly encouraged in healthcare settings to explore how entrepreneurial leadership supports workforce resilience, professional competency enhancement, employee retention, healthcare service innovation, and digital health transformation in increasingly complex and technology-driven healthcare environments.

4. CONCLUSION

This systematic literature review demonstrates that entrepreneurial leadership plays a significant role in human capital development by enhancing workforce competencies, strengthening employee engagement and talent retention, and promoting innovation capability within organizations. The reviewed studies consistently indicate that entrepreneurial leaders

foster continuous learning, empowerment, adaptability, and knowledge sharing, which contribute to improved organizational performance and workforce sustainability. In addition, digital transformation, Industry 4.0, artificial intelligence, and sustainability initiatives increasingly influence the effectiveness of entrepreneurial leadership in developing human capital. Overall, the findings suggest that entrepreneurial leadership is an important approach to supporting human capital development in dynamic, rapidly changing organizational environments, including healthcare organizations.

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