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QUANTUM LEADERSHIP: A BIBLIOMETRIC ANALYSIS FOR FUTURE RESEARCH AGENDA

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ABSTRACT

In an era marked by volatility, uncertainty, complexity, and ambiguity (VUCA), traditional leadership paradigms are increasingly insufficient to address the demands of dynamic organizational environments. This study investigates quantum leadership as a future-oriented response to these challenges and aims to systematically map the evolution, intellectual structure, and emerging themes of quantum leadership research from 2010 to mid-2025. A bibliometric analysis was conducted using data retrieved from the Scopus database, with the final search performed in July 2025. The dataset was generated using the search query TITLE-ABS-KEY ("quantum leadership"), refined through inclusion criteria that limited results to peer-reviewed publications published between 2010 and 2025 and written in all available languages. Following screening and relevance filtering, 78 highly relevant documents were retained for analysis. Bibliometric techniques, including citation analysis, co-authorship networks, and keyword co-occurrence mapping, were applied using VOSviewer. The findings reveal a clear evolution of quantum leadership from a conceptual metaphor into a multidisciplinary research domain, with increasing applications in healthcare, artificial intelligence (AI) ethics, sustainability, and organizational innovation. Thematic analysis indicates a shift from early emphases on interpersonal communication and systems awareness toward emerging interests in AI, consciousness, employee creativity, and organizational adaptability. From a practical perspective, the study highlights the relevance of quantum leadership for organizations navigating technological disruption and complexity. Leaders may apply quantum principles such as mindfulness, empathy, adaptive decision-making, and relational intelligence to foster innovation, psychological safety, and co-creative organizational cultures.

KEYWORDS: Quantum Leadership, Bibliometric Analysis, Thematic Mapping, Vosviewer, Collaboration, Employee Creativity, Organizational Innovation.

1. INTRODUCTION

In today's volatile, uncertain, complex, and ambiguous (VUCA) world, traditional leadership models are increasingly challenged by dynamic organizational environments that demand adaptability, innovation, and holistic thinking. Against this backdrop, quantum leadership has emerged as a novel paradigm that blends principles from quantum physics with leadership theories to address the complexity of modern organizations (Cai et al., 2024; Şenses & Temoçin, 2018). The term quantum leadership, coined in the late 20th century, seeks to transcend linear, mechanistic approaches by embracing interconnectedness, uncertainty, and transformational change (Leong, 2025). As organizations navigate digital disruption, hybrid work models, and heightened stakeholder expectations, quantum leadership offers a framework for fostering agility, systems thinking, and shared purpose (Cai et al., 2024).

Although the concept of quantum leadership has gained attention in recent years, its theoretical development remains underexplored and fragmented. A key characteristic of quantum leadership is its departure from Newtonian thinking, which is marked by cause and effect logic and hierarchical control, toward a paradigm that recognizes relationships, energy flow, and emergent patterns (Erçetin & Kayman, 2014; Yared et al., 2025). Leaders operating within this model act as facilitators of meaning and catalysts of organizational coherence, rather than top-down decision-makers. This shift is particularly relevant in healthcare, education, sustainability initiatives, and technology sectors, where adaptive leadership is essential for coping with rapid change and stakeholder complexity (Watson et al., 2018).

Despite the growing interest, a comprehensive synthesis of quantum leadership scholarship in the literature is still lacking. Existing research tends to be largely theoretical or conceptual in nature, with limited empirical grounding. Furthermore, no consolidated effort has been made to map the intellectual structure, identify key contributors, trace thematic evolution, and analyze emerging trends within the field. This gap impedes the formulation of robust research agendas and limits the practical application of quantum leadership in real-world settings. To address this issue, bibliometric analysis offers a valuable methodological approach for systematically assessing the evolution of knowledge in the field, identifying influential publications and authors, and uncovering thematic clusters for future investigation.

Bibliometric methods offer a quantitative lens to examine academic literature, using techniques such as citation analysis, co-authorship patterns, keyword co-occurrence, and thematic mapping (Manickam & Abd Rozan, 2023; Yahiaoui et al., 2024). In the context of leadership studies, bibliometric analysis has been applied to various domains, including transformational (Wijayanti et al., 2025), transactional (Udin et al., 2025), entrepreneurial (Sai et al., 2025), and authentic leadership (Gao et al., 2024). Other areas include agile (Udin, 2025), servant (Klepec & Škerlavaj, 2025), abusive (Udin & Dananjoyo, 2025), inclusive (Malik & Nasir, 2023), digital (Tigre et al., 2023), ethical (Hsieh et al., 2023), spiritual (Garg & Jalan, 2025), and Islamic leadership (Udin, 2024). However, quantum leadership has not yet been subjected to the same level of bibliometric scrutiny. This study aims to fill this scholarly void by conducting a bibliometric analysis spanning from 2010 to 2025, thereby providing a foundation for advancing both theory and practice in quantum leadership.

Accordingly, this study addresses the following research objectives: (1) to map the scientific production in quantum leadership from 2010 to 2025; (2) to identify the most influential authors, sources, and institutions; (3) to examine co-citation and co-word networks revealing the field's intellectual and conceptual structure; and (4) to propose a future research agenda based on emerging trends and thematic gaps. By doing so, the study contributes to the consolidation of quantum leadership as a legitimate and actionable field of inquiry, paving the way for its practical implementation.

2. LITERATURE REVIEW

2.1. Emergence of Quantum Leadership

Quantum leadership derives its core philosophy from metaphors rooted in quantum physics, emphasizing interconnectivity, complexity, uncertainty, and adaptive transformation (Cai et al., 2024; Harrington, 2023). Unlike classical models that seek linear causality and control, quantum leadership recognizes organizations as living systems, where energy, relationships, and meaning matter more than hierarchies and procedures (Maheshwari, 2023). It invites leaders to empower teams, embrace paradox, foster creativity, and manage change with conscious awareness and systems thinking. Far from being merely theoretical, this leadership model aligns with the post-industrial, knowledge-driven era, where innovation, collaboration, and responsiveness define competitive advantage (Leong, 2025). Quantum leadership is

increasingly recognized as essential in complex systems such as healthcare (Harrington, 2023), education (Snyder et al., 2025), digital technology (Cai et al., 2024), and sustainability-oriented businesses.

2.2. Key Dimensions and Theoretical Grounding

Quantum leadership integrates concepts from complexity science, chaos theory, mindfulness, and emotional intelligence. The works of Porter-O'Grady (1999), Malloch and Porter-O'Grady (2009), and Wheatley (2011) laid the conceptual groundwork by portraying organizations as complex adaptive systems and emphasizing a relational, holistic leadership approach.

Key dimensions of quantum leadership emerging from the literature (Cai et al., 2024; Erçetin & Kayman, 2014; Leong, 2025; Maheshwari, 2023) include: (1) Connectivity over control (i.e., leaders act as facilitators of relationships and energy). Leaders foster collaboration, shared meaning, and collective purpose by facilitating energy and interaction; (2) Dynamic change management (i.e., flexibility and learning replace rigid planning). Instead of relying on rigid, long-term plans, leaders adopt adaptive strategies that evolve in real time, aligning with the complexity and unpredictability of modern organizational environments; (3) Ethical and spiritual (i.e., authenticity, purpose, and trust become central). Quantum leaders lead not merely with power or intellect, but from a deeply values-driven and purpose-oriented core, fostering meaningful engagement and a shared sense of significance within the organization; and (4) Systems thinking (i.e., leaders see beyond silos and understand networks of influence). Leaders with a systems perspective recognize the web of relationships, patterns of interaction, and networks of influence that shape outcomes across the organization and its broader environment. Thus, quantum leadership presents a transformative approach to navigating complexity and fostering adaptive, ethical, and resilient organizations in a rapidly evolving world.

2.3. Impacts of Quantum Leadership

Quantum leadership creates a workplace where employees take center stage (Harrington, 2023). It fosters an environment in which human energy, creativity, and authenticity are recognized as the true drivers of organizational success. Rather than simply delegating tasks or enforcing control, quantum leaders serve as facilitators who cultivate trust, strengthen relationships, and prioritize

psychological safety (Cai et al., 2024). They create conditions in which individuals feel seen, heard, and valued, thereby encouraging them to bring their whole selves to work. In this space, employees are not just followers; they become active contributors who co-create purposeful solutions. This sense of shared ownership leads to deeper engagement, stronger intrinsic motivation, and a greater willingness to innovate (Zhang et al., 2024). As a result, teams collaborate more effectively, adapt more readily, and perform with greater creativity and resilience.

Quantum leadership empowers individuals to break away from rigid, linear thinking. Instead, it encourages them to make thoughtful decisions in the midst of complexity and to adapt quickly and confidently to ever-changing environments (Leong, 2025). Under this leadership style, employees are not merely expected to follow but are supported in developing their own adaptive capacity, creativity, and resilience. At its core, quantum leadership nurtures a culture of continuous personal and professional growth (Cai et al., 2024). It inspires individuals to move from a fixed mindset, where abilities are seen as static, to a growth mindset that embraces learning, experimentation, and self-leadership. This shift lays the foundation for lifelong learning and personal evolution. Moreover, quantum leadership emphasizes the power of interconnectedness and open systems (Harrington, 2023). It recognizes that individuals and teams thrive when their voices are heard. Through this lens, leadership becomes a catalyst for unlocking collective intelligence and creative potential across the organization (Narzikul & O'Connor, 2024).

3. RESEARCH METHODS

This study employed a bibliometric analysis based on the Scopus database to examine the evolution and intellectual structure of research on quantum leadership. Bibliographic records were retrieved exclusively from Scopus, with the final data collection conducted in July 2025. To ensure methodological transparency, precision, and replicability, an exact search query was applied using the Scopus advanced search syntax. Specifically, the query TITLE-ABS-KEY ("quantum leadership") was used, which resulted in a total of 312 indexed documents. After filtering by publication year, which was restricted to the period between 2010 and July 2025, the results narrowed to 246 documents. To refine the focus further, a combination of keywords, including "Leadership," "Quantum Theory," and "Quantum Leadership," was applied, resulting in a

final dataset of 78 documents considered highly relevant for in-depth analysis.

In terms of document types, the majority were journal articles, accounting for 53.8% (42 documents), reflecting the prominence of peer-reviewed research in this domain. Book chapters comprised 16.7% (13 documents), while conference papers represented 12.8% (10 documents), indicating a modest presence of preliminary or emerging findings disseminated through academic gatherings. Other publication types included editorials (7.7%), reviews (3.8%), notes (2.6%), as well as a single data paper and book, each representing 1.3% of the dataset.

Language distribution revealed a strong dominance of English-language publications, which accounted for 94.9% (74 documents), affirming the global orientation of scholarly communication in this field. The remaining documents were published in Russian (2.6%), Portuguese (1.3%), Spanish (1.3%), and Turkish (1.3%), indicating limited regional diversification in the discourse on quantum leadership.

Regarding open access status, approximately 29.5% of the documents were available through all open access, allowing access via institutional or subject repositories after an embargo period. Green open access accounted for 16.7%, providing versions of the work in freely accessible repositories.

Meanwhile, 14.1% of the publications were categorized as gold open access, meaning they were fully accessible through open-access journals. The remaining documents included bronze open access (6.4%) and hybrid gold access (5.1%), both published in subscription-based journals with selected articles made openly accessible.

4. RESULTS AND DISCUSSION

In the first five years (2010–2014), as shown in Table 1, this study observes a slow and scattered emergence of scholarly attention, with an average of 1–3 publications per year and fluctuating citation counts. While the total number of publications remained modest, for example only nine articles across five years, the presence of citations, particularly 22 in 2010, suggests that early foundational works had begun to shape academic discourse.

This period likely represents a phase of conceptual exploration, during which the ideas of quantum leadership were being introduced, theorized, and debated. Such a pattern is common for groundbreaking or interdisciplinary frameworks, which often face initial skepticism or marginalization, especially when their conceptual

foundations deviate from traditional empirical paradigms in leadership studies.

The period from 2015 to 2017 reflects a phase of relative stagnation in quantum leadership research when assessed through both publication output and citation impact. Annual publication volume during this period remained low and stable, with only two publications in 2015, one in 2016, and two in 2017. More notably, citation activity declined sharply, reaching zero citations in both 2015 and 2016. Although citations increased to 16 in 2017, this figure remained substantially lower than the levels observed in subsequent years, particularly after 2018. These numeric patterns indicate that, while scholarly interest did not disappear entirely, quantum leadership research during 2015–2017 lacked sustained visibility and academic influence. The combination of minimal publication growth and limited citation uptake suggests that the field had not yet reached a critical mass of researchers or achieved broader theoretical or empirical legitimacy.

A significant turning point occurred in 2018, with 10 publications and 47 citations. This marked the beginning of rapid acceleration, culminating in 2020, which recorded the highest citation count (144), despite having the same number of publications as in 2018.

Following this breakthrough period, quantum leadership research maintained consistent scholarly productivity, with 6–12 publications per year and citation counts stabilizing between 35 and 51 annually. This consistency suggests that quantum leadership is no longer a fringe concept. It is becoming increasingly institutionalized within leadership discourse, evidenced by growing networks of researchers, rising co-authorship, and integration into academic conferences and doctoral research.

As of mid-2025, four publications and zero citations have been recorded. While this may initially appear modest, such outcomes are common in bibliometric studies, particularly for recent publications.

This is largely attributable to two key factors. First, a time lag in citation accumulation is typical, as newly published articles often require several months or even years to gain scholarly recognition and be cited in subsequent research. Second, delays in indexing can affect visibility, as some journals may not yet be fully processed or reflected in major databases such as Scopus. Consequently, the current citation count should not be interpreted as a definitive measure of scholarly impact.

Table 1: Publication Records by Publication Years (2010–2025).

Year	Publications	Total citations
2010	2	22
2011	1	8
2012	2	1
2013	3	12
2014	1	8
2015	2	0
2016	1	0
2017	2	16
2018	10	47
2019	3	12
2020	10	144
2021	6	41
2022	8	35
2023	12	51
2024	11	50
2025	4	0

The article by Watson et al. (2018), as indicated in Table 2, holds the highest citation count (20 citations), highlighting its significant scholarly impact. This influence stems from both the high credibility of the authors and the depth of their conceptual synthesis. Published in *Nursing Science Quarterly*, the article effectively bridges quantum leadership principles, such as nonlinearity, relationality, and systems thinking, with foundational elements of caring science, including empathy, compassion, and authentic presence. This integrative approach not only advances theoretical discourse but also resonates with practitioners seeking human-centered leadership models in complex healthcare environments.

The article by Nigri et al. (2020), published in the *Entrepreneurship Research Journal*, marks a significant pivot in the discourse on quantum leadership by shifting from abstract theoretical frameworks to concrete applications in entrepreneurship and social innovation. By exploring its integration within Benefit Corporations (B-Corps), the authors demonstrate how quantum leadership principles are being operationalized in contemporary organizational models. This study provides compelling evidence that quantum leadership is no longer confined to philosophical debates or limited to the healthcare sector; rather, it is increasingly shaping innovative business practices and organizational structures that prioritize

stakeholder value and systemic impact. The work thus reinforces the argument that quantum leadership is evolving into a practical and strategic approach for guiding purpose-driven enterprises in complex and uncertain environments.

The article by Dargahi (2013) stands out as the earliest top-cited publication on the list, marking a pioneering effort to apply quantum leadership theory within healthcare settings. Although it has garnered a modest number of citations (9), its early publication date underscores its foundational role in introducing quantum leadership to the field. Notably, Dargahi situates the framework within the socio-cultural and organizational complexities of the Iranian healthcare system, an environment characterized by hierarchical rigidity, centralized control, and bureaucratic inertia. These contextual challenges make it a compelling case for the application of quantum leadership. As such, the study not only bridges Western leadership theory and Middle Eastern organizational realities but also anticipates the relevance of quantum principles for managing complexity and fostering transformation within rigid institutions.

The study by Bilgen and Elçi (2022) is the most empirically rigorous among the top five and was published in a Q1 journal (*Frontiers in Psychology*). It examines how organizational intelligence mediates the relationship between quantum leadership and innovative behavior, thereby empirically testing a causal model. The paper investigates leadership outcomes (e.g., innovation), providing actionable insights for managers and policymakers.

Although recently published, the study by Cai et al. (2024) has already garnered five citations, indicating early scholarly traction. Published in *Sustainability (Switzerland)*, the research situates quantum leadership within the context of organizational sustainability and innovation. The findings empirically validate the positive influence of quantum leadership on employee innovation, supporting the argument that this leadership paradigm enhances organizational intelligence, promotes knowledge sharing, and boosts innovation performance.

Table 2: Top 5 Most-highly-cited Articles.

Rank	Document title	Authors	Source	Year	Total citations
1	Quantum caring leadership: Integrating quantum leadership with caring science	Watson, J., Porter-O'Grady, T., Horton-Deutsch, S., Malloch, K.	<i>Nursing Science Quarterly</i> , 31(3), pp. 253–258	2018	20
2	The Mondora method: Quantum leaders in benefit corporations	Nigri, G., Del Baldo, M., Agulini, A.	<i>Entrepreneurship Research Journal</i> , 10(4), 20190309	2020	10

3	Quantum leadership: The implication for Iranian nursing leaders	Dargahi, H.	Acta Medica Iranica, 51(6), pp. 411–417	2013	9
4	The mediating role of organizational intelligence in the relationship between quantum leadership and innovative behavior	Bilgen, A., Elçi, M.	Frontiers in Psychology, 13, 1051028	2022	6
5	Validating the causal relationship between quantum leadership and employee innovation performance from the perspective of organizational sustainability	Cai, H., Zhu, L., Jin, X.	Sustainability Switzerland, 16(18), 7884	2024	5

All top four authors, as shown in Table 3, are affiliated with the University of Southern California (USC). This clustering of productive authors within a single institution indicates the presence of a core research hub or collaborative lab dedicated to exploring quantum paradigms, possibly from a multidisciplinary angle involving leadership, complexity science, and systems modeling. Such institutional concentration is often characteristic of emerging or interdisciplinary fields, where new theories take root through intensive local collaboration before gaining broader global traction. In this case, USC appears to serve as an intellectual incubator for foundational research in the quantum leadership discourse.

The H-indices of Kalia (65), Vashishta (66), and Nakano (60) are exceptionally high, suggesting that these scholars are established authorities, but likely in fields outside traditional leadership studies, such as computational science, quantum physics, or

complex systems. This implies that quantum leadership, as it is discussed in their publications, may be emerging from a science-driven or simulation-based epistemology, rather than from mainstream leadership theory alone.

Nomura, K.I. has slightly fewer publications (4) and a lower h-index (27), suggesting a more focused or emerging contributor. Still at USC, Nomura may represent next-generation scholars or those integrating engineering and organizational complexity. In addition, Luo, Y. from Argonne National Laboratory, a U.S. Department of Energy facility, has three publications and an h index of 14, which is modest in comparison. However, this presence is highly significant because it suggests that national laboratories and government research institutions are engaging with quantum leadership frameworks, possibly in artificial intelligence (AI) ethics, strategic planning, or resilient systems management.

Table 3: Top five Profilic Authors.

Rank	Author name	Affiliation	Publications	H-Index
1	Kalia, R.K.	University of Southern California, Los Angeles, United States	5	65
2	Nakano, A.	University of Southern California, Los Angeles, United States	5	60
3	Vashishta, P.	University of Southern California, Los Angeles, United States	5	66
4	Nomura, K.I.	University of Southern California, Los Angeles, United States	4	27
5	Luo, Y.	Argonne National Laboratory, Lemont, United States	3	14

The most striking observation is the appearance of *Nature*, a world class multidisciplinary science journal with an SJR of 18.288 and an H Index of 1,442, as the top ranked journal by impact, as indicated in Table 4. However, this also complicates the epistemological identity of quantum leadership. Articles published in *Nature* are typically anchored in quantum physics, information theory, or complex systems modeling, which are domains far removed from mainstream organizational behavior or leadership studies. As such, their inclusion under the banner of “quantum leadership” suggests a conceptual borrowing rather than a direct

application. This reinforces the notion that the foundations of quantum leadership are deeply rooted in the language and logic of the hard sciences. Consequently, its presence in *Nature* may reflect a more abstract, metaphorical engagement with scientific principles, rather than a direct contribution to management practice or theory.

The presence of two nursing journals, *Nursing Administration Quarterly* and *Nursing Science Quarterly*, as recurring sources of quantum leadership literature underscores the concept’s practical anchoring within the healthcare sector. These journals frequently publish research on

leadership models that prioritize empathy, ethics of care, and systems thinking, which are core dimensions that align closely with the philosophical underpinnings of quantum leadership. Healthcare organizations, particularly hospitals, function as complex adaptive systems characterized by unpredictability, rapid change, and interprofessional dynamics. Within this context, nurses operate at the intersection of clinical precision and emotional labor, making them uniquely positioned to engage with leadership frameworks that emphasize non-linearity, interconnectedness, and human-centered transformation. Quantum leadership resonates strongly with nursing practice because it shifts away from hierarchical command-and-control models, instead promoting a caring presence, conscious decision-making, and collaborative energy fields within organizational life. These attributes are vital in environments where patient outcomes depend not only on technical competence but also on emotional attunement and systemic awareness.

The Journal of Management, Spirituality and Religion (JMSR) represents a pivotal epistemological shift in management scholarship. Its inclusion of quantum leadership studies signifies more than thematic breadth; it signals a deliberate convergence between spiritual-humanistic paradigms and post-classical scientific metaphors. JMSR acts as a critical mediator, bridging abstract quantum principles with leadership constructs grounded in self-awareness, authenticity, and moral purpose. By providing a platform where leadership is reimagined not as hierarchical control but as energy alignment, embodied presence, and co-creative capacity, the journal challenges reductionist managerial paradigms. It fosters an understanding of leadership as an emergent, dynamic process shaped by both inner consciousness and external relational fields.

Like *Nature*, the Journal of the American Chemical Society (JACS) is a top-tier technical science journal (SJR 5.554, H-index 734) with strong influence in physical chemistry, materials science, and molecular modeling. Its presence in the dataset indicates that the term “quantum leadership” remains partially contested and is sometimes used in a technical rather than organizational sense. In several cases, articles indexed under this term refer to leadership within quantum research teams, laboratory management, or strategic direction in quantum science and technology, rather than leadership as a behavioral or organizational construct. Accordingly, the appearance of high-impact multidisciplinary and technical journals such as *Nature* and JACS among the top-ranked sources (Table 4) requires careful

methodological interpretation. Their inclusion does not suggest a substantive contribution to leadership theory. Instead, it reflects Scopus indexing overlap and keyword-based retrieval processes, which capture publications containing the term “quantum leadership” in titles, abstracts, or keywords irrespective of disciplinary orientation. Thus, their presence illustrates the semantic breadth and multidisciplinary diffusion of the search term rather than a direct theoretical engagement with leadership studies.

Table 4: Top five Journals.

Rank	Journal	Publications	SJR 2024	H-Index
1	Nature	3	18.288	1,442
2	Nursing administration quarterly	3	0.656	47
3	Journal of management spirituality and religion	3	0.491	39
4	Journal of the American chemical society	2	5.554	734
5	Nursing science quarterly	2	0.564	43

One of the most powerful insights from Table 5 is the evident geographic and cultural diversity among the leading institutions contributing to quantum leadership research. These include Hacettepe Üniversitesi in Turkey, representing Eurasia, Argonne National Laboratory in the United States as a national research infrastructure, the University of Southern California in the United States as a prominent academic research hub, Universidade de São Paulo in Brazil as a major Latin American university, and the University of Maryland in the United States, which is known for integrating policy and scientific inquiry. This global dispersion suggests that quantum leadership is not an exclusively Anglo-American or Global North-driven paradigm. Instead, it is being conceptualized and operationalized across a wide spectrum of institutional types, spanning public research institutes, elite academic centers, and universities in emerging economies. This also indicates a pluralistic evolution of the field, shaped by culturally diverse perspectives and cross-sectoral insights. The presence of both developed and developing nations among the top contributors reflects that quantum leadership resonates with complex leadership challenges faced across various global contexts, particularly those involving uncertainty, nonlinearity, and systemic transformation. This supports the view that quantum leadership is seen as a globally adaptable leadership paradigm, capable of addressing complex challenges in multicultural, interdisciplinary, and postcolonial environments. The theory’s emphasis on interconnectedness, systemic awareness, and adaptive complexity is

highly resonant across diverse leadership contexts, from government labs to university hospitals to entrepreneurial ecosystems.

The United States emerges as the undisputed leader in this domain, contributing 28 publications, which is four times more than any other country. Its commanding position is further emphasized by an exceptional H-index of 3,213, reflecting both the depth and sustained impact of its scholarly output. This dominance is not accidental, but rather the result of a synergistic interplay of factors: the presence of globally renowned research universities (such as the University of Southern California and the University of Maryland), the strategic involvement of national laboratories (e.g., Argonne National Laboratory), and robust funding ecosystems supported by agencies like the National Science Foundation (NSF), National Institutes of Health (NIH), and the Department of Energy (DoE). These institutions collectively foster an environment in which interdisciplinary and experimental approaches to leadership theory, such as quantum leadership, can flourish.

Turkey's second place ranking, with eight publications and a respectable H index of 647, is both unexpected and significant. This reflects the rising influence of Global South and postcolonial perspectives in shaping 21st-century leadership theory. Turkish researchers often engage with non-Western philosophical traditions, including Sufism, ethical relationality, and holistic knowing, which harmonize well with quantum leadership's metaphysical dimensions.

With 7 publications and a very high H-index of 1,455, China emerges as both a productive and influential contributor. However, its role needs careful unpacking. China's high H-index is likely driven by its extensive publication output in the hard sciences, especially physics, systems engineering, and quantum technologies. It is plausible that some

Chinese publications tagged under quantum leadership are situated more in the technical realm, for example leadership in quantum computing research and development, rather than in organizational or psychological leadership per se.

Japan's position (5 publications, H-index 1,364) reflects a historical strength in systems philosophy, organizational innovation, and non-Western management theory. Japanese scholars have long integrated ideas such as: Kaizen (continuous improvement), Ba (shared context for knowledge creation), and holistic awareness in leadership (inspired by Buddhism). These deeply align with quantum leadership's themes of fluidity, mindfulness, relational awareness, and non-linearity.

The United Kingdom (UK), despite contributing a modest number of publications (only 4), exhibits an exceptionally high H-index of 2,048. This statistical contrast underscores the disproportionate citation impact and intellectual influence of UK-based research in the field. Rather than relying on publication volume, the UK's contribution appears to be qualitative in depth and theoretical in reach. These works likely offer foundational or paradigm-challenging insights that resonate across disciplines. Notably, scholarship in the United Kingdom has a strong tradition of interrogating dominant epistemologies, particularly the limits of mechanistic and hierarchical leadership models inherited from industrial era thinking. It also frequently critiques the neoliberal emphasis on efficiency, output, and control, which often dehumanizes the workplace and narrows the scope of leadership theory. Instead, UK researchers tend to foreground relationality, meaning-making, systems thinking, and complexity. Thus, the UK's high H-index reflects its role not merely as a contributor of content, but as a shaper of discourse, offering intellectually generative critiques and alternatives that others in the field cite, build upon, and debate.

Table 5: Top five Affiliations and Countries.

Rank	Affiliation	Publications	Rank	Country	Publications	H-Index
1	Hacettepe Üniversitesi	5	1	United States	28	3,213
2	Argonne National Laboratory	5	2	Turkey	8	647
3	University of Southern California	5	3	China	7	1,455
4	Universidade de São Paulo	3	4	Japan	5	1,364
5	University of Maryland, College Park	3	5	United Kingdom	4	2,048

Quantum leadership studies, as shown in Figure 1, are broadly distributed across multiple academic fields, reflecting its inherently interdisciplinary and metaphor-driven foundation. The largest

concentrations appear in Business & Management (11.0%) and Computer Science (11.0%), highlighting the concept's dual role in both organizational strategy and complex systems modeling. In Business

and Management, quantum leadership is applied to navigate uncertainty, foster innovation, and enable systems thinking in rapidly changing environments. Meanwhile, the presence in Computer Science indicates a conceptual borrowing from quantum computing, AI, and cybernetics to design adaptive and intelligent leadership frameworks. Substantial contributions from the Social Sciences (9.6%), Medicine (8.8%), and Nursing (7.4%) underscore the model's relevance in addressing human dynamics, empathy, resilience, and systemic change. Similarly, Engineering (6.6%) and Biochemistry, Genetics & Molecular Biology (5.9%) point to applications in systems engineering and neurobiological

perspectives on leadership, while Mathematics (4.4%) and Chemistry (5.1%) provide the foundational logic for understanding complexity and unpredictability, core to the quantum paradigm. The Multidisciplinary category (5.0%) and a significant "Other" segment (25.0%) demonstrate the theory's broad appeal and applicability across non-traditional domains, including education, environmental studies, and the humanities. This wide distribution affirms that quantum leadership is not restricted to any single academic silo, but instead serves as a transdisciplinary lens through which complex adaptive leadership challenges can be addressed.

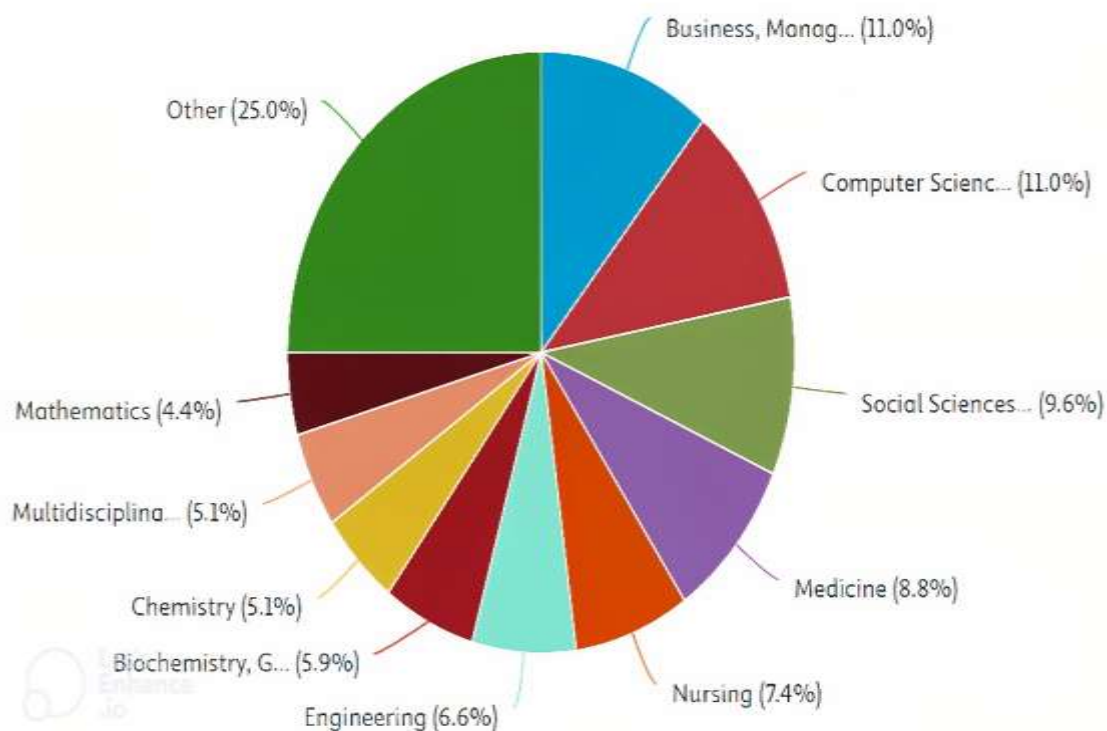


Figure 1: Distribution of Quantum Leadership Publications by Subject area (2010–2025).

The co-authorship network in Figure 2 reveals distinct clusters of scholarly collaboration. Three authors, Li, F. from the National Research Center of Parallel Computer Engineering and Technology in China, Zhang, Y. from Lanzhou University of Technology in China, and Wang, P. from Shandong University of Finance and Economics in China, emerge as central connectors within this intellectual landscape. These individuals serve as critical bridging nodes that link otherwise insular research groups. The red cluster, anchored by Wang, P., displays a high degree of internal cohesion, suggesting the presence of a well-established, institutionally supported research group. Meanwhile, the green cluster, co-led by Li, F. and

Zhang, Y., is somewhat more dispersed yet still marked by strong intra-group collaboration. Wang, P. functions as a key collaborative hub, connecting researchers across institutions and reinforcing his strategic role as a facilitator of knowledge exchange. In parallel, Li, F. and Zhang, Y. actively collaborate with both senior scholars and emerging academics, positioning themselves as catalysts for cross-institutional and potentially interdisciplinary research. The interlinkages among Li, Wang, and Zhang form a structural backbone within the network, offering a promising conduit for scholarly synergy, innovation, and the broader diffusion of quantum leadership concepts across academic and institutional boundaries.

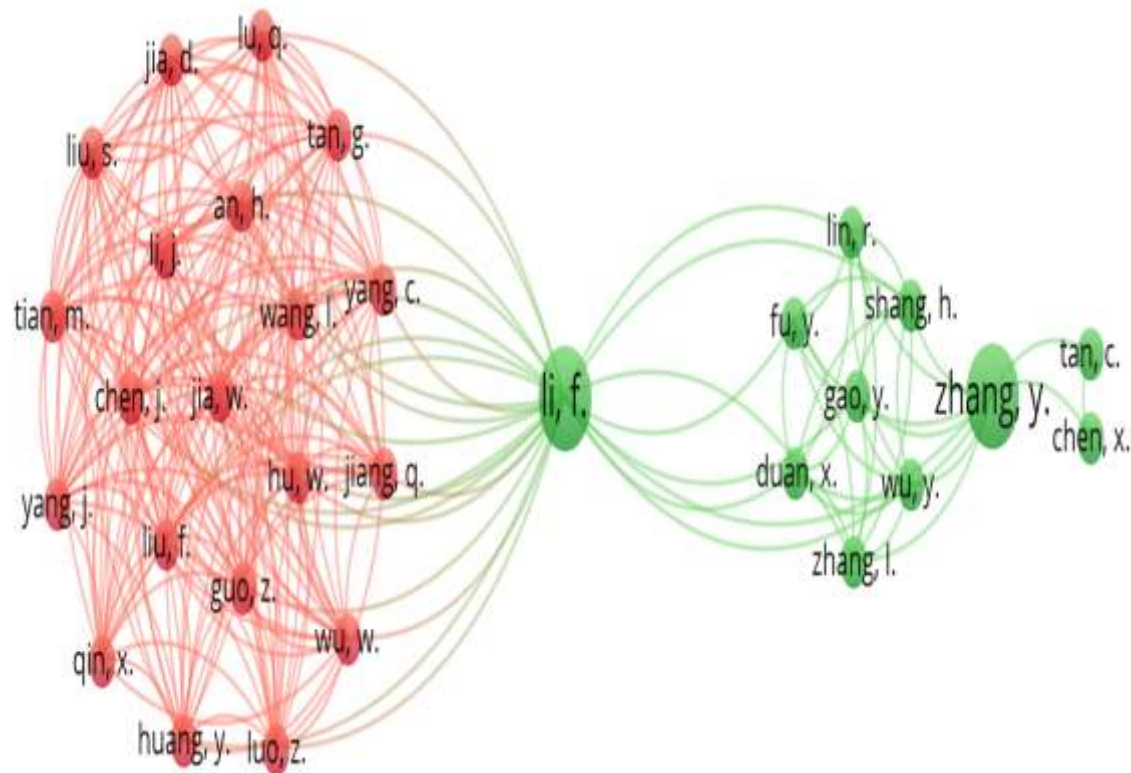


Figure 2: Co-authorship Networks of Quantum Leadership.

The overlay visualization, as indicated in Figure 3, maps the evolution of key terms in the quantum leadership literature from 2010 to 2025. The color gradient from blue to yellow represents the average publication year for each term: Blue (2010–2015) indicates early-stage focus areas, Green (2016–2020) reflects maturing research themes, and Yellow (2021–2025) highlights emerging topics.

Interpersonal communication, recognized as one of the foundational themes during the early period of 2010–2015, highlights the critical role of dialogue, relational dynamics, and shared meaning-making within the quantum leadership paradigm. This phase marked a shift toward communication-centered and relational approaches, aligning closely with core quantum principles such as uncertainty, interconnectedness, and non-linear causality.

Between 2016 and 2020, quantum leadership research expanded to encompass a deeper conceptual and practical integration with key themes such as consciousness, innovation, empathy, healthcare delivery, and organizational dynamics in healthcare.

During this period, the concept of quantum leadership increasingly emphasized awareness and mindfulness as critical strategies to enhance employees' capacity for disruptive thinking and creativity, particularly in the face of complexity.

Furthermore, the growing integration of emotional intelligence into leadership frameworks highlighted an urgent need to navigate uncertainty within complex adaptive systems like healthcare.

AI has emerged as a significant and cutting-edge theme in the period from 2021 to 2025, marking a transformative intersection between quantum leadership and digital transformation. Recent studies, such as those by Hoffmann and Flöther (2024), Cai et al. (2024), have begun to explore how leadership paradigms must adapt in increasingly AI-driven environments, where traditional, linear models of leadership may prove insufficient. This shift underscores the necessity for leaders to navigate complexity, uncertainty, and rapid technological change with a more dynamic and interconnected mindset.

The integration of AI into quantum leadership discourse signals a forward looking expansion of the field by incorporating critical considerations such as ethics, automation, and human machine collaboration. As AI systems increasingly influence decision-making and organizational processes, quantum leadership offers a framework that aligns with adaptive thinking, relational intelligence, and non-linear problem-solving, which are qualities essential for leading in the age of intelligent machines.



Figure 3: Overlay Visualization of Quantum Leadership.

Quantum leadership integrates consciousness, empathy, and decision-making into a cohesive framework that embraces complexity, fosters authentic human connection, and enables agile, adaptive responses (see Figure 4). At its core, quantum leadership emphasizes expanded awareness and mindful presence, encouraging leaders to move beyond habitual thinking and engage with the deeper dynamics of organizational life (Maheshwari, 2023). As Wheatley (2011) suggests, conscious leaders are better equipped to transcend automatic responses, recognize systemic interdependencies, and embrace paradox. This heightened consciousness allows leaders to shift from reactive behaviors to reflective practices, promoting intentional and thoughtful decision-making. Furthermore, quantum leadership views organizations not as static structures, but as living systems composed of interconnected individuals. In this context, empathy becomes essential. By cultivating empathy, leaders can create psychological safety, encourage co-creation, and

unlock collective intelligence (Lei, 2025).

Quantum leadership presents a forward-thinking, complexity-responsive model that is particularly relevant in an era marked by technological disruption and relational interdependence. In increasingly AI-driven environments, it offers a vital framework for integrating advanced technologies with human-centered values (Lima, 2025). Rather than treating AI as a purely technical tool, quantum leaders understand it as part of a complex adaptive system, where human and machine intelligence can work in synergy (Prete et al., 2024). AI is not seen as a replacement for human insight, but as a powerful complement that enhances decision-making, foresight, and pattern recognition (Tabata et al., 2025). Equally important, quantum leadership emphasizes the relational and communicative nature of leadership. Communication, in this view, is not merely transactional but dialogical, emergent, and context-sensitive. It serves as a medium through which shared realities are co-constructed, rather than simply transmitted.



Figure 4: Network visualization of quantum leadership.

Quantum leadership provides a compelling framework for fostering both employee creativity and organizational innovation (Cai et al., 2024). It

recognizes that creativity thrives not through control or predictability, but through freedom, diverse perspectives, and a psychologically safe

environment. In contrast to mechanistic leadership models that prioritize command and routine, quantum leaders cultivate a culture of exploration, emotional intelligence, and comfort with ambiguity. By embracing uncertainty as a catalyst rather than a threat, quantum leaders inspire employees to challenge assumptions, experiment with ideas, and reframe problems in novel ways (Zhang et al., 2024). Additionally, quantum leadership promotes distributed and dynamic influence, empowering individuals at all levels to lead change, contribute ideas, and take initiative without fear of failure (Erçetin & Kayman, 2014; Leong, 2025). This flatter, adaptive structure enhances autonomy, intrinsic motivation, and a sense of ownership, all of which are essential for sustained creativity and innovation.

At the macro level, quantum leadership fosters organizational innovation by viewing the organization as a complex adaptive system (Leong, 2025). Rather than relying on rigid, top-down strategies, quantum leaders cultivate conditions that support emergence, collaborative intelligence, and cross-functional synergy. They prioritize interconnectivity by integrating diverse stakeholders, perspectives, and knowledge systems, thereby accelerating knowledge recombination, which is a key driver of radical innovation (Shriya & Velmurugan, 2024). In addition, quantum leaders emphasize reflective learning, adaptive experimentation, and strategic agility (Cuomo & Foroudi, 2025), all of which are crucial for sustaining innovation in today's fast-changing, complex environments.

5. CONCLUSION

This bibliometric analysis offers the first comprehensive mapping of quantum leadership scholarship from 2010 to mid-2025, revealing its evolution from a conceptual metaphor into a legitimate, multidisciplinary field of inquiry. Initially met with limited traction, quantum leadership has gained increasing scholarly momentum, particularly since 2018, demonstrating growing institutional and thematic consolidation across fields such as business, healthcare, computer science, and sustainability.

The findings underscore several critical insights. First, the thematic evolution of the literature reflects a shift from interpersonal communication and systems thinking toward emerging intersections with consciousness, AI, and innovation. These transitions suggest that quantum leadership is not static but is dynamically responsive to the complexity of modern organizational environments. Second, the increasing number of empirical studies, particularly those

validating causal relationships with outcomes such as employee innovation and organizational intelligence, marks a significant step toward stronger theoretical grounding and greater practical applicability. Notably, the involvement of high-impact journals, international institutions, and multidisciplinary collaborations signals the paradigm's growing academic legitimacy.

Geographically, the United States leads the field; however, notable contributions from Turkey, China, Japan, and the United Kingdom reveal that quantum leadership resonates globally across diverse cultural and institutional contexts. This global dispersion, together with varied epistemological roots drawn from complexity science, spirituality, and AI ethics, highlights the adaptability and transdisciplinary relevance of quantum leadership. This study contributes not only by documenting the intellectual structure and key contributors but also by identifying thematic clusters and emerging frontiers for future research. These include the integration of AI with quantum leadership, ethical decision-making in digital contexts, employee creativity, and leadership within complex adaptive systems.

In light of its expanding scope and strategic relevance, quantum leadership presents a promising framework for addressing the complex leadership challenges of the 21st century. Future research should prioritize deeper empirical validation, investigate cross-cultural applications, and refine theoretical models that link quantum leadership to organizational performance, innovation, and sustainability. Ultimately, this study lays the foundation for quantum leadership to evolve from a compelling theoretical construct into a transformative practice that is capable of guiding organizations through complexity, disruption, and continual change.

The findings of this study offer actionable insights for leaders, HR professionals, and policymakers navigating increasingly complex, AI-driven environments. Quantum leadership, which is centered on adaptability, interconnectedness, and systems thinking, provides a robust framework for managing volatility and fostering innovation. Organizations can apply quantum principles to cultivate psychological safety, encourage employee creativity, and support inclusive, non-linear decision-making processes. This approach is particularly vital in high-complexity sectors such as healthcare, education, and sustainability, where relational dynamics and systemic interdependence are pronounced. Leaders are urged to transcend traditional control-based models and adopt

facilitative, relational roles that leverage collective intelligence and mindful presence. Moreover, integrating quantum leadership with emerging technologies, including AI, enables ethical and human-centered innovation. To prepare future ready organizations, leadership development programs should embed core quantum competencies, such as emotional intelligence, reflective learning, and relational awareness, into training curricula. Ultimately, quantum leadership reframes leadership as a dynamic and adaptive force operating within complex systems, moving beyond hierarchical command toward participative, holistic influence.

5.1. Limitation and Future Research Direction

Despite providing a comprehensive bibliometric analysis of quantum leadership literature from 2010 to mid-2025, this study has several limitations. First, the analysis is confined to the Scopus database, which, although widely recognized for its breadth and quality, may omit relevant studies indexed in other databases such as Web of Science, Dimensions, or Google Scholar (Ruirui & Hashim, 2025). Second, the reliance on keyword-based search strategies may have excluded studies that address quantum leadership concepts using alternative terminologies

or implicit frameworks. Third, the use of citation-based metrics tends to favor older publications, thereby potentially underestimating the scholarly impact of recent studies due to inherent citation lag.

Future research should address these limitations by employing multi-database triangulation and utilizing broader, more inclusive keyword strategies to capture a wider spectrum of relevant literature. Empirical studies are also essential to validate the causal pathways linking quantum leadership to key organizational outcomes such as innovation, resilience, employee well-being, and adaptability. Comparative cross-cultural investigations could further illuminate how quantum leadership principles are interpreted and operationalized within diverse institutional and socio-cultural contexts. Moreover, interdisciplinary integration with fields such as AI, neuroscience, and complexity science offers promising avenues for deepening the theoretical foundations of quantum leadership. Ultimately, future scholarship should prioritize the development of actionable frameworks that translate abstract concepts into practical strategies capable of addressing real-world organizational complexities and fostering adaptive, human-centered leadership practices.

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REFERENCES

- Bilgen, A., & Elçi, M. (2022). The mediating role of organizational intelligence in the relationship between quantum leadership and innovative behavior. *Frontiers in Psychology, 13*, 1051028. doi: 10.3389/fpsyg.2022.1051028
- Cai, H., Zhu, L., & Jin, X. (2024). Validating the Causal Relationship between Quantum Leadership and Employee Innovation Performance from the Perspective of Organizational Sustainability. *Sustainability (Switzerland), 16*(18). doi: 10.3390/su16187884
- Cuomo, M. T., & Foroudi, P. (2025). Quantum Leadership in the Era of Complexity. In M. T. Cuomo & P. Foroudi (Eds.), *Quantum Level Business Model: A New Managerial Perspective* (pp. 59-81). Cham: Springer Nature Switzerland.
- Dargahi, H. (2013). Quantum leadership: The implication for Iranian nursing leaders. *Acta Medica Iranica, 51*(6), 411-417.
- Erçetin, Ş. Ş., & Kayman, E. A. (2014). How to be a quantum leader in an intelligent organization? *Springer Proceedings in Complexity* (pp. 247-252).
- Gao, J., Huang, T., Xu, Y., & Li, T. (2024). Authentic Leadership in Nursing From 2006 to 2022: A Bibliometric Analysis and Visualization Analysis. *American Journal of Health Behavior, 48*(1), 167-176. doi: 10.5993/AJHB.48.1.16
- Garg, N., & Jalan, S. (2025). Spiritual Leadership Research: Past, Present and Future Using Bibliometric Analysis. *Journal of Religion and Health, 64*(2), 999-1030. doi: 10.1007/s10943-024-02178-2

- Harrington, A. (2023). Quantum leadership: a new approach for nurse leaders. *Nursing management (Harrow, London, England : 1994)*, 30(4), 25-31. doi: 10.7748/nm.2022.e2059
- Hoffmann, C. H., & Flöther, F. F. (2024). Why business adoption of quantum and AI technology must be ethical. *Research Directions: Quantum Technologies*, 2(4), 1-9. doi: <https://doi.org/10.48550/arXiv.2312.10081>
- Hsieh, C.-C., Tai, S.-E., & Li, H.-C. (2023). A Bibliometric Review of Ethical Leadership Research: Shifting Focuses and Theoretical Insights. *AERA Open*, 9, 23328584231209266. doi: 10.1177/23328584231209266
- Klepec, B. M., & Škerlavaj, M. (2025). Exploring the synergy: The role of shared and servant leadership in the innovation process through bibliometric analysis. *Dynamic Relationships Management Journal*, 14(1), 79-100. doi: 10.17708/DRMJ.2025.v14n01a05
- Lei, L. (2025). Emotional Intelligence in Leadership *Elgar Encyclopedia of Leadership* (pp. 65-67).
- Leong, D. (2025). Re-Contextualizing Leadership Theories Through a Quantum Perspective on Dao/Yijing. *Journal of Management, Spirituality and Religion*, 22(2), 226-248. doi: 10.51327/OFAV9641
- Lima, A. D. S. (2025). Artificial Intelligence and Leadership *Elgar Encyclopedia of Leadership* (pp. 6-8).
- Maheshwari, A. K. (2023). Quantum Leadership Through Yoga Sutras *Palgrave Studies in Workplace Spirituality and Fulfillment* (Vol. Part F4220, pp. 45-76): Palgrave Macmillan.
- Malik, M. J. N., & Nasir, N. (2023). A Bibliometric Analysis of Inclusive Leadership from 1990 to 2022. *Journal of Politics and International Studies*, 9(2), 93-106.
- Malloch, K., & Porter-O'Grady, T. (2009). *The quantum leader: Applications for the new world of work*. Massachusetts: Jones & Bartlett Learning.
- Manickam, M. K., & Abd Rozan, M. Z. (2023). Bibliometric analysis of entrepreneurial competencies using Scopus data and VOSviewer. *International Journal of Advanced and Applied Sciences*, 10(1), 198-207. doi: 10.21833/ijaas.2023.01.025
- Narzikul, T. D., & O'Connor, M. (2024). Systems Caring: Guiding Principles for Leaders. *Nurse Leader*, 22(3), 295-297. doi: 10.1016/j.mnl.2024.03.004
- Nigri, G., Del Baldo, M., & Agulini, A. (2020). The Mondora Method: Quantum Leaders in Benefit Corporations. *Entrepreneurship Research Journal*, 10(4), 20190309. doi: 10.1515/erj-2019-0309
- Porter-O'Grady, T. (1999). Quantum Leadership: New Roles for a New Age. *JONA: The Journal of Nursing Administration*, 29(10).
- Prete, M., Degli Innocenti, E., Ottoboni, F., & Tasca, M. (2024). Augmented Humanistic Leadership: A New Framework for Leaders' Tools in the Age of Artificial Intelligence *Progress in IS* (Vol. Part F4055, pp. 237-245).
- Ruirui, L., & Hashim, H. A. (2025). Exploring dynamic capabilities in digital transformation: A bibliometric and content analysis. *International Journal of Advanced and Applied Sciences*, 12(6), 141-153. doi: 10.21833/ijaas.2025.06.014
- Sai, C., Omar, A. R. C., Juhdi, N. H., & Hizam-Hanafiah, M. (2025). Trends in entrepreneurial leadership: A bibliometric analysis. *Multidisciplinary Reviews*, 8(9). doi: 10.31893/multirev.2025284
- Şenses, B., & Temoçin, P. (2018). An interdisciplinary study: Quantum leadership and hybrid leadership *Springer Proceedings in Complexity* (pp. 547-559).
- Shriya, K., & Velmurgan, T. (2024). Entrepreneurship in quantum-led corporations: Hyperdimensional incubation for open innovation in conventional practices *Entrepreneurship Innovation and Education for Performance Improvement* (pp. 200-222).
- Snyder, K. J., Snyder, K. M., & Mårtensson, A. (2025). The energy that drives human networked organizations: a model for leading schools to thrive in complex times. *Frontiers in Education*, 10. doi: 10.3389/educ.2025.1583773
- Tabata, M., Wildermuth, C., Bottomley, K., & Jenkins, D. (2025). Generative AI Integration in Leadership Practice: Foundations, Challenges, and Opportunities. *Journal of Leadership Studies*, 18(4), 41-54. doi: 10.1002/jls.70005
- Tigre, F. B., Curado, C., & Henriques, P. L. (2023). Digital Leadership: A Bibliometric Analysis. *Journal of Leadership and Organizational Studies*, 30(1), 40-70. doi: 10.1177/15480518221123132
- Udin, U. (2024). Islamic leadership: Bibliometric analysis of global research using VOSviewer. *International Journal of Human Capital in Urban Management*, 9(4), 735-746. doi: 10.22034/IJHCUM.2024.04.12
- Udin, U. (2025). Agile leadership and employee outcomes: A bibliometric analysis for future research agenda. *Human Systems Management*, 44(2), 237-248. doi: 10.3233/HSM-240093
- Udin, U., & Dananjoyo, R. (2025). Abusive Leadership in Organizations: Insights from Bibliometric Analysis for

- Future Research Agenda. *International Research Journal of Multidisciplinary Scope*, 6(2), 115-126. doi: 10.47857/irjms.2025.v06i02.03799
- Udin, U., Dananjoyo, R., & Shaikh, M. (2025). Transactional leadership in public sector organizations: A bibliometric analysis. *International Journal of Advanced and Applied Sciences*, 12(7), 239-245. doi: <https://doi.org/10.21833/ijaas.2025.07.024>
- Watson, J., Porter-O'Grady, T., Horton-Deutsch, S., & Malloch, K. (2018). Quantum Caring Leadership: Integrating Quantum Leadership With Caring Science. *Nursing Science Quarterly*, 31(3), 253-258. doi: 10.1177/0894318418774893
- Wheatley, M. (2011). *Leadership and the new science: Discovering order in a chaotic world*. Oakland: Berrett-Koehler Publishers.
- Wijayanti, A. W., Riani, A. L., Harsono, M., & Suyono, J. (2025). Exploring the Link Between Transformational Leadership and Innovative Work Behavior: A Bibliometric and Scientific Mapping Analysis. *TEM Journal*, 14(2), 1367-1377. doi: 10.18421/TEM142-37
- Yahiaoui, F., Chergui, K., & Aichouche, R. (2024). Mapping the growth and trends of knowledge management in health organizations: A bibliometric exploration. *International Journal of Advanced and Applied Sciences*, 11(3), 158-174. doi: 10.21833/ijaas.2024.03.017
- Yared, G., Massaad, C., & Ghazal, K. (2025). Quantum leadership: New approach in managing shoulder dystocia in simulation-based training. *Future Science OA*, 11(1). doi: 10.1080/20565623.2025.2458427
- Zhang, Y., Chen, X., & Tan, C. (2024). A mechanistic study of the influence of quantum leadership on employees' constructive deviance. *Chinese Management Studies*. doi: 10.1108/CMS-01-2024-0051