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HUMAN CAPITAL AND JOB SATISFACTION: TRENDS AND INSIGHTS FROM A BIBLIOMETRIC PERSPECTIVE

This study presents a bibliometric analysis of publications on human capital and job satisfaction indexed in the Web of Science Core Collection between 2019 and 2024. Using bibliometric methods, we examine publication trends, citation impact, keyword co-occurrence, and co-authorship networks. The results indicate an increasing number of publications, with highly cited studies shaping theoretical advancements. Keyword analysis reveals dominant themes such as work engagement, turnover intention, and employee motivation, while emerging topics like remote work and workforce well-being highlight research gaps.

The co-authorship analysis suggests fragmented collaboration networks, with limited international partnerships in this domain. These findings underscore the need for greater interdisciplinary and global research collaboration to enhance knowledge exchange. Given the critical role of human capital in organizational success, our study emphasizes the implications for Human Resources (HR) management, particularly in talent retention, job design, and employee well-being strategies. Strengthening HR policies based on evidence from these research trends can contribute to improved job satisfaction and organizational performance.

This study contributes to the academic field by providing an overview of existing research trends, identifying influential studies, and suggesting future research directions. The results can assist scholars, policymakers, HR professionals, and practitioners in better understanding the dynamics of human capital and job satisfaction research.

Introduction

Human capital and job satisfaction are critical components in modern economic and organizational research. Human capital, defined as the collective skills, knowledge, and abilities of individuals within a workforce, plays a fundamental role in driving economic productivity and business success (Becker, 1993). Simultaneously, job satisfaction is a key determinant of employee performance, retention, and overall workplace well-being (Judge et al., 2001). Organizations and policymakers continuously strive to optimize both human capital development and job satisfaction to enhance labor market efficiency, employee engagement, and long-term economic growth (OECD, 2019). Given its significance, several studies have attempted to explore the various dimensions of human

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capital and job satisfaction, examining the impact of education and skill development (Acemoglu, & Autor, 2011), organizational commitment (Meyer, & Allen, 1991), and workplace motivation (Herzberg, 1966). These studies provide a fragmented yet valuable understanding of how human capital influences job satisfaction and vice versa.

However, while these studies contribute significantly to the theoretical and empirical discourse, research on human capital and job satisfaction remains broad and methodologically diverse. Various models have been developed to explain the relationship between these variables, but a structured synthesis of the available literature is missing. A bibliometric approach enables a systematic evaluation of existing research trends, key contributors, and evolving themes in the field (Zupic, & Čater, 2015). Bibliometric analysis has been successfully applied in fields such as human resource management, workplace well-being (Ramos-Villagrasa et al., 2018), and labor economics (Card et al., 2018), providing structured insights into scholarly developments.

In the context of human capital and job satisfaction, a bibliometric review is particularly necessary to track how research has evolved over time, which topics dominate the academic landscape, and how collaboration networks have shaped intellectual contributions. While previous bibliometric studies have focused on broad labor market trends (Schmidt et al., 1998) or human capital theory applications (Teixeira, & Fortuna, 2004), no recent study has provided an exhaustive bibliometric assessment of human capital and job satisfaction research.

The purpose of this study is to provide a bibliometric analysis of human capital and job satisfaction research published in Web of Science Core Collection -indexed journals between 2019 and 2024. By analyzing publication trends, citation networks, keyword co-occurrence patterns, and co-authorship collaborations, this study aims to uncover key insights into the evolution of research in this field. Through this structured assessment, the study aims to highlight dominant themes, identify leading scholars and institutions, and pinpoint research gaps that warrant further exploration.

General overview

Understanding human capital and job satisfaction requires a thorough examination of their theoretical foundations and empirical relationships. Human capital theory, as proposed by Becker (1993), underscores the importance of education, skills, and experience in driving productivity and economic growth. These factors are closely linked to job satisfaction, which is influenced by an individual's perception of their workplace environment and career opportunities (Judge et al., 2001). As employees develop their skills and acquire experience, they often seek autonomy and career growth, which, in turn, influence their job satisfaction levels (Acemoglu, & Autor, 2011).

Job satisfaction theories, such as Herzberg's Two-Factor Theory (1966), offer further insights into how intrinsic and extrinsic workplace factors contribute to employees' well-being. Salary and job security serve as extrinsic motivators, but intrinsic aspects like personal growth, recognition, and workplace engagement play a critical role in long-term job contentment (Meyer, & Allen, 1991). Empirical research supports these theories, showing that skill development and professional opportunities significantly impact workplace satisfaction. For example, studies indicate that employees with higher educational attainment tend to report greater job satisfaction, mainly due to increased career mobility and autonomy (Solomon et al., 2021). However, variations exist across industries and economic conditions, highlighting the complexity of the relationship between human capital and job satisfaction (OECD, 2019).

Beyond individual factors, organizational structures also play a crucial role in shaping job satisfaction. Research has demonstrated that environments fostering innovation and career development contribute positively to employee engagement and retention (Card et al., 2018).

Conversely, dissatisfaction often leads to increased turnover intention, particularly when leadership is ineffective or career advancement opportunities are lacking (Schmidt et al., 1998). The interconnection between job satisfaction, employee motivation, and organizational commitment emphasizes the need for workplaces to adopt strategies that enhance workforce well-being. Recent research in this journal (Otti et al., 2025) further supports these findings, highlighting that flexible employment strategies and skills-based HR policies have a direct impact on employee retention and job satisfaction, particularly in dynamic labor markets.

In this context, the role of personal branding has gained increasing attention as a career development tool. A primary study conducted among university students by Papp-Váry, Hajnal, and Czeglédi (2020) found that a significant majority of young adults are aware of the concept of personal branding and recognize its potential in shaping their career paths. The findings indicate that students view personal branding as a means of expressing individuality and enhancing employability, particularly in competitive labor markets. This awareness underscores the growing relevance of self-directed human capital development and the strategic role of identity management in job satisfaction and career success.

The period between 2019 and 2024 has witnessed significant transformations in labor market structures and workforce dynamics, with global events shaping research directions in human capital and job satisfaction. The COVID-19 pandemic, in particular, acted as a catalyst for workplace changes, accelerating digital transformation and remote work adoption while shifting employee expectations regarding job security, mental well-being, and work-life balance (Brynjolfsson et al., 2020). Organizations had to rapidly adapt, reevaluating their human capital strategies by prioritizing flexible work arrangements, digital upskilling, and employee well-being initiatives (Carnevale, & Hatak, 2020). These shifts have been reflected in scholarly discussions, with increasing research focus on the implications of remote work, burnout, and changing job satisfaction determinants (Spurk, & Straub, 2020).

A human resource management (HR) perspective further enriches the understanding of these dynamics. The increasing prevalence of remote and flexible work arrangements also necessitates a reevaluation of HR practices to ensure employees remain engaged and satisfied in evolving work environments. Additionally, Otti, Fehér and Szabó (2025) emphasize that digital competencies and adaptive HR frameworks play a crucial role in maintaining workforce stability and organizational resilience, particularly in the face of labor market volatility.

To analyze these trends, bibliometric methods provide valuable insights by mapping scholarly developments and citation networks within labor economics, human resource management, and workplace psychology. Zupic and Čater (2015) highlight bibliometric approaches as effective tools for identifying research trends, while similar studies in workforce well-being have revealed key publication patterns and knowledge gaps (Ramos-Villagrasa et al., 2018). Given its extensive coverage of peer-reviewed literature, Web of Science Core Collection was chosen as the primary database for this study. It offers comprehensive metadata, including citation networks and keyword co-occurrence analysis, making it an ideal platform for tracking research on human capital and job satisfaction (Teixeira, & Fortuna, 2004).

Recent bibliometric analyses point to a growing focus on remote work, digital transformation, and workforce well-being, reflecting shifts in labor market priorities (Teixeira, & Fortuna, 2004). Despite these developments, collaboration among researchers remains fragmented, with limited international partnerships observed in co-authorship networks (Lenihan et al., 2019). This lack of cross-border collaboration suggests an opportunity to expand interdisciplinary perspectives, integrating sociological and psychological dimensions alongside economic and managerial viewpoints.

While research has extensively examined the relationship between human capital and job satisfaction, gaps remain that warrant further exploration. A more interdisciplinary approach is needed to incorporate diverse perspectives on workplace well-being, while increased international collaboration could provide a broader understanding of labor market trends across different economies. Additionally, new workplace dynamics such as remote work adaptation and digital skill development present emerging challenges that require deeper investigation. By leveraging bibliometric analysis, this study aims to offer a comprehensive assessment of existing research while highlighting areas for future inquiry, ultimately contributing to the advancement of knowledge in this field.

Material and methods

This study relies on Web of Science Core Collection, a comprehensive and widely recognized database of peer-reviewed literature, ensuring access to high-quality academic sources. Web of Science Core Collection was selected due to its extensive coverage of high-impact journals and its advanced bibliometric tools, making it an appropriate choice for evaluating research trends in human capital and job satisfaction. The research focuses on literature published between 2019 and 2024, allowing for an up-to-date assessment of scholarly activity in this field.

To retrieve relevant articles, a structured search query was developed using Boolean operators, ensuring precision in article selection. The query targeted the title, abstract, and keyword fields to encompass a broad yet relevant selection of studies. The search strategy used in Web of Science Core Collection follows a systematic approach that integrates specific terms related to human capital and job satisfaction, ensuring the inclusion of studies that contribute meaningfully to the discourse.

To maintain a rigorous selection process, inclusion and exclusion criteria were applied. The study exclusively considered peer-reviewed journal articles published in English that directly addressed the themes of human capital and job satisfaction within the specified timeframe. Duplicates and non-peer-reviewed sources, such as conference proceedings, book chapters, and editorials, were excluded to ensure the integrity of the dataset. Furthermore, studies that, despite containing relevant keywords, were determined to be outside the core focus of this study were omitted. Additionally, non-English articles without available translations were excluded to maintain consistency in analysis and accessibility. The methodological framework guiding this study is summarized in the following table:

TABLE 1. OVERVIEW OF THE METHODOLOGICAL FRAMEWORK

| Component	Description
Database	Web of Science Core Collection
Timeframe	2019–2025
Search Strategy	Boolean-based TITLE-ABS-KEY query targeting human capital and job satisfaction
Inclusion	Peer-reviewed articles, English language, relevance to human capital and job satisfaction
Exclusion	Duplicates, non-peer-reviewed sources, articles outside the research scope, non-English papers without translations

Source: own editing.

Derived from prior literature and observed bibliometric patterns, this study is grounded in following research hypotheses:

- **H1:** Research on human capital and job satisfaction has significantly grown from 2019–2024, indicating increasing scholarly interest in the field.
- **H2:** A small number of highly cited papers dominate the discourse, shaping key theoretical advancements in human capital and job satisfaction.
- **H3:** Keyword trends reveal a strong relationship between job satisfaction and workplace factors such as employee motivation, turnover intention, and organizational commitment.
- **H4:** Co-authorship networks in human capital and job satisfaction research are fragmented, with limited international collaboration.

The process of article selection and refinement for this bibliometric analysis was systematically documented using the PRISMA framework, ensuring a transparent and replicable methodology. The PRISMA flowchart (Figure 1) details the number of research articles retrieved from Web of Science Core Collection, the records screened for relevance, the studies excluded based on predefined criteria, and the final articles included in the analysis.

FIGURE 1. THE PROCESS OF EXTRACTING RELEVANT DATA USED FOR BIBLIOMETRIC ANALYSIS.
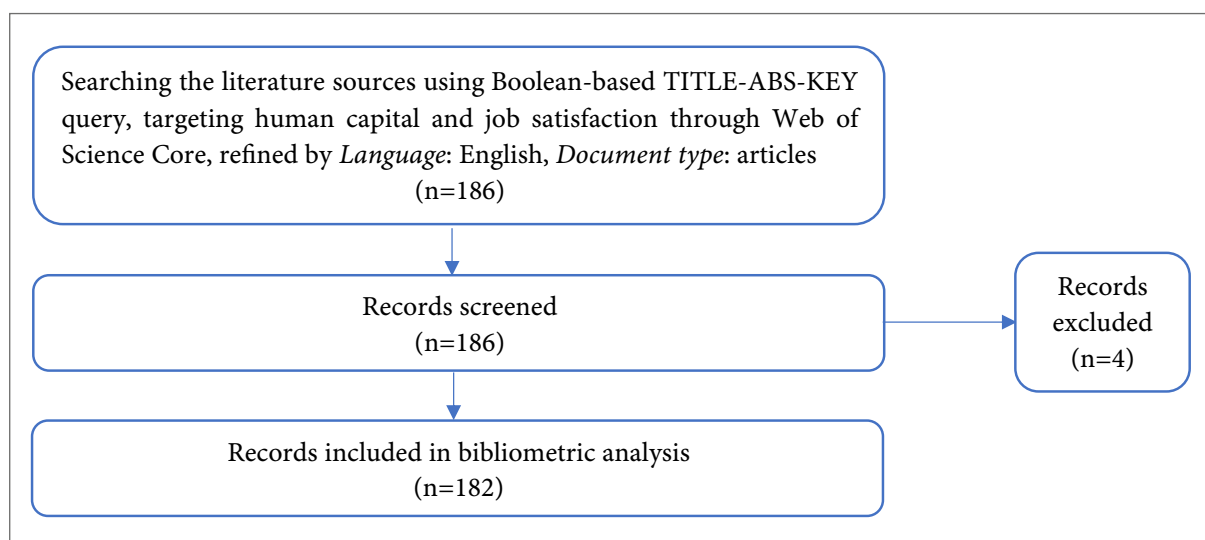
Source: own editing.

This structured approach enhances the reliability of the study by providing a clear overview of how the dataset was refined, ensuring that only high-quality, peer-reviewed research on human capital and job satisfaction was considered. During the abstract screening phase, four items were excluded due to their limited relevance to the intended research field.

Results

- **H1:** Research on human capital and job satisfaction has significantly grown from 2019–2024, indicating increasing scholarly interest in the field.

Based on previous literature reviews indicating a growing trend in scholarly work on human capital and job satisfaction, as highlighted by multiple systematic reviews showing an upward trajectory in research interest, we initially hypothesized a steady increase in publications from 2019 to 2024. However, the observed data reveals a fluctuating pattern rather than a consistent rise.

In 2019, there were 23 publications, and this number increased to 27 in 2020, despite the challenges posed by the onset of the COVID-19 pandemic, which disrupted research agendas, funding, and data collection efforts. The modest rise in 2020 could indicate the early adjustments researchers

made in response to these challenges. However, the sharp increase in publications to 41 in 2021 suggests a partial recovery as more stable research conditions began to take hold. Despite this growth, the number dropped to 25 in 2022, suggesting that ongoing global uncertainties and shifting academic priorities continued to affect scholarly output.

In 2023, the number of publications slightly rebounded to 29, possibly reflecting renewed interest in the connection between employee well-being and organizational performance. Yet, it is the surge to 31 publications in 2024 that most significantly deviates from our initial assumption of a consistent upward trend, indicating how fluctuating funding opportunities, institutional emphasis on human resource development, and the expansion of research linking human capital to broader economic and societal outcomes have influenced the volume of scholarly work.

These results illustrate that, although external factors such as emerging funding and institutional shifts may drive research growth, they do not necessarily result in a linear upward trajectory. The fluctuations in publication numbers show the complexity of how real-world events and evolving scholarly interests shape the research landscape on human capital and job satisfaction, which highlights the need to consider both external factors and research dynamics in understanding trends in the field.

- **H2:** A small number of highly cited papers dominate the discourse, shaping key theoretical advancements in human capital and job satisfaction.

A limited number of highly cited papers dominate the discourse on human capital and job satisfaction, shaping the theoretical advancements in the field. The citation data from the dataset highlights that studies, with significantly higher citation counts, have established themselves as key references in ongoing academic discussions.

For example, "Driving Innovation: Public Policy and Human Capital" by Lenihan, McGuirk, and Murphy (2019), frequently cited in the research on human capital's role in economic development, has emerged as one of the foundational studies in this area. Another extensively cited work, "Transactive Memory Systems in Context: A Meta-Analytic Review" by Bachrach, Lewis, Kim, Patel, and Campion (2021), has made a substantial impact on how leadership and collaborative dynamics are understood within human resource development.

These influential papers provide critical frameworks for subsequent research, serving as guiding theories in human capital and job satisfaction. Works such as "The Future of Employee Development" by Dachner, Ellingson, Noe, and Saxton (2017) continue to be widely referenced, particularly for their insights into the evolving nature of workforce development and the future of talent management. Similarly, "Stress in Teaching Professionals Across Europe" by Redín and Erro-Garcés (2022) contributes to contemporary discussions on job satisfaction in educational contexts.
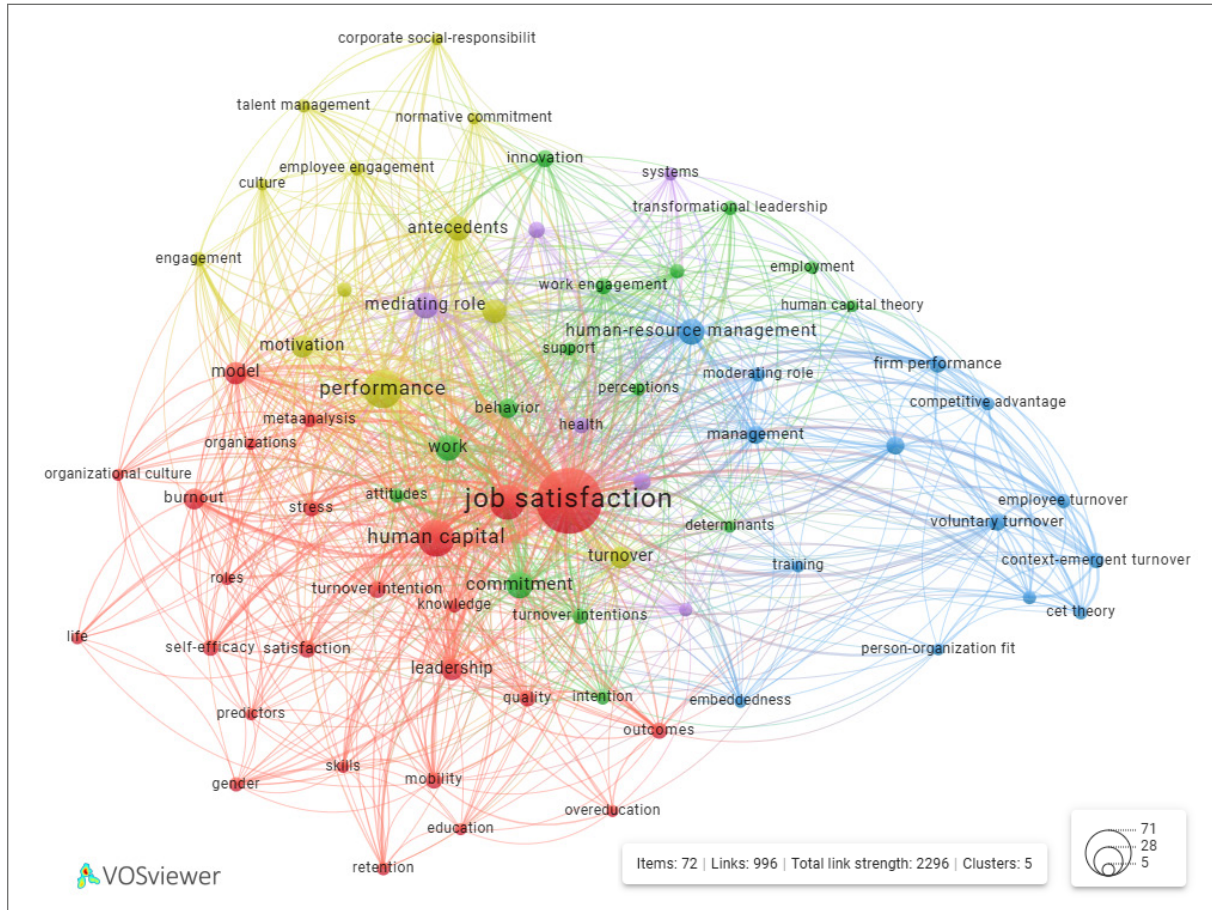
The citation patterns of these works underline their theoretical dominance. These studies function not only as references for new academic research but also as benchmarks for policy recommendations, shaping how organizations and governments approach human capital issues. The concentration of citations within these key works illustrates the field's reliance on a select group of seminal papers, which have fundamentally shaped the landscape of human capital research. Their influence continues to resonate, guiding both academic exploration and practical applications in labor market and organizational policy.

- **H3:** Keyword trends reveal a strong relationship between job satisfaction and workplace factors such as employee motivation, turnover intention, and organizational commitment.

Keyword trends in the network map (Figure 2) reveal a compelling interdependence between job satisfaction and key workplace factors, such as employee motivation, turnover intention, and

organizational commitment. These factors are intricately linked through frequent co-occurrence, illustrating their collective influence on employee well-being and organizational performance. In particular, job satisfaction serves as a central node, strongly connected to employee motivation and turnover intention. This connection emphasizes how satisfaction directly impacts retention and the broader organizational commitment, highlighting the importance of maintaining a motivated workforce to ensure long-term stability (Meyer et al., 2001).

FIGURE 2. KEYWORD OCCURRENCE NETWORK, 2019–2025.

Source: authors' editing; https://app.vosviewer.com/?json=https%3A%2F%2Fdrive.google.com%2Fuc%3Fid%3D1Dxa-x0gWFlI-7wapEp16wqyhlmxH4RO9

The structure of the keyword network underscores the interconnectedness of these workplace factors. For example, terms like "employee motivation" and "turnover intention" form a cohesive cluster with job satisfaction, reinforcing the idea that these concepts are not isolated but rather interwoven, reflecting the complex relationship between workplace satisfaction and employee behavior (Kuvaas, 2009). The close association between these keywords suggests that enhancing job satisfaction can directly influence motivation levels and reduce turnover intention, which, in turn, strengthens organizational commitment.

Moreover, "human capital," "human resource development," and "human resource management" emerge as pivotal terms, forming another significant cluster. These keywords illustrate how strategic workforce development and effective human resource practices are crucial for creating positive work environments that support both job satisfaction and organizational success. The close connections between these terms further highlight the importance of aligning human resource strategies with broader organizational goals to foster a motivated and committed workforce.
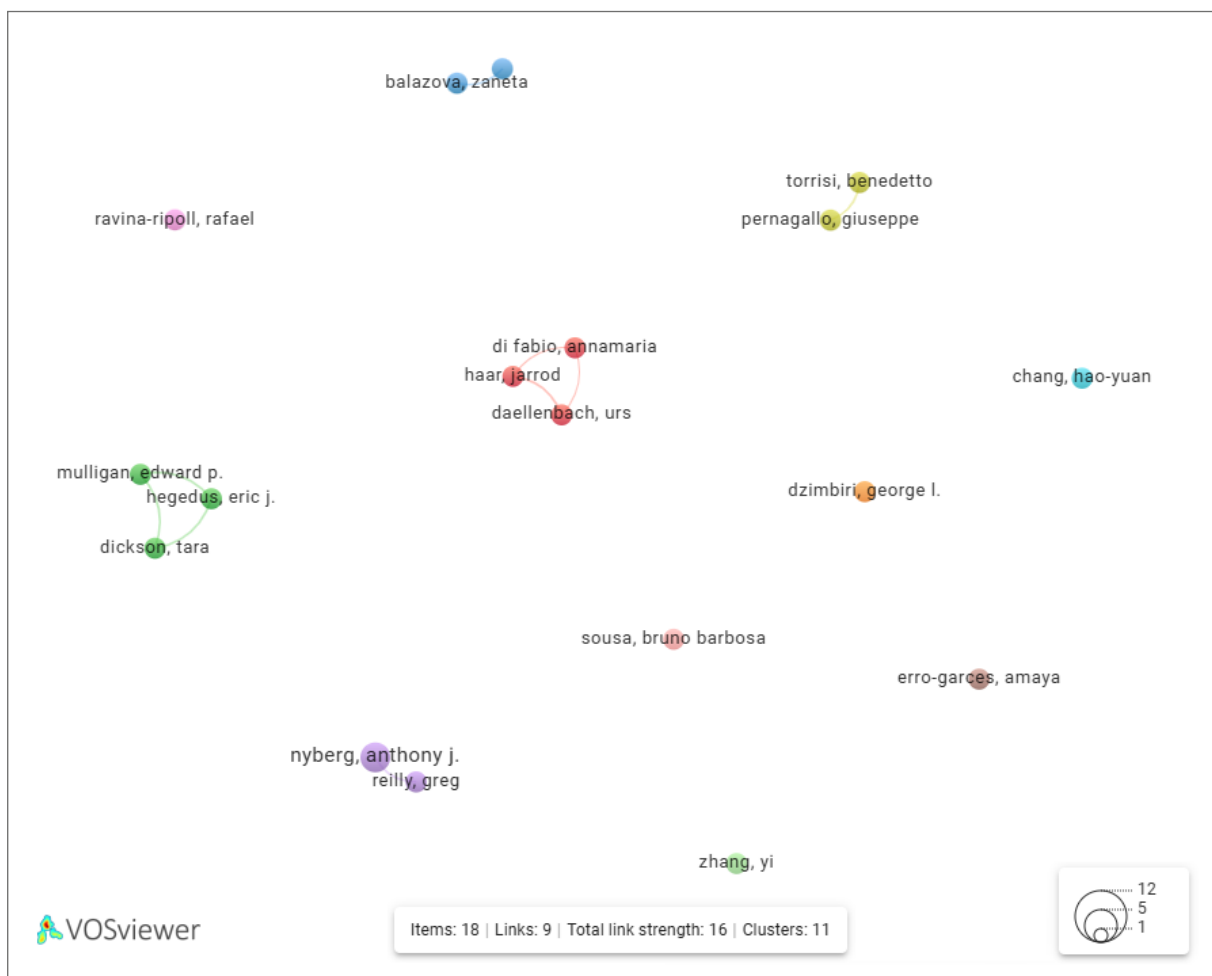
Additionally, keywords like "transformational leadership," "innovation," and "talent management" are grouped together, reflecting the growing recognition that leadership style and innovative strategies play a crucial role in driving employee engagement, job satisfaction, and organizational performance. The presence of these terms in close proximity signals that effective leadership and a focus on innovation are key drivers of positive workplace outcomes.

This keyword network analysis reinforces the hypothesis that job satisfaction is deeply intertwined with other workplace factors such as employee motivation, turnover intention, and organizational commitment. The connections between these terms demonstrate the strength of their relationships and the importance of fostering a supportive and engaging work environment to enhance job satisfaction and, ultimately, organizational success.

H4: Co-authorship networks in human capital and job satisfaction research are fragmented, with limited international collaboration.

The analysis of co-authorship networks (Figure 3) in human capital and job satisfaction research reveals a fragmented structure, characterized by isolated clusters of collaboration and limited international connectivity. The visualization of author relationships indicates that most researchers work within small, localized groups rather than engaging in broad, cross-border research collaborations.

FIGURE 3. CO-AUTHORSHIP NETWORK, 2019–2025.

Source: authors' editing; https://app.vosviewer.com/?json=https%3A%2F%2Fdrive.google.com%2Fuc%3Fid%3D1vytDAM41IOwD0R0zJiTVu9I37qaZ-uzD

One key observation is the presence of discrete research clusters, where authors frequently collaborate within their institutional or regional networks but have few connections to scholars from other parts of the world (Figure 4). This fragmentation limits the exchange of diverse perspectives and the development of globally relevant insights into job satisfaction and human capital dynamics.

Additionally, while some strong co-authorship links exist, suggesting well-established academic partnerships, these relationships are typically concentrated within the same country or academic institution. This lack of widespread collaboration is reflected in the absence of dominant, highly interconnected nodes that would indicate extensive international cooperation.

FIGURE 4. COLLABORATION NETWORK, 2019–2025.
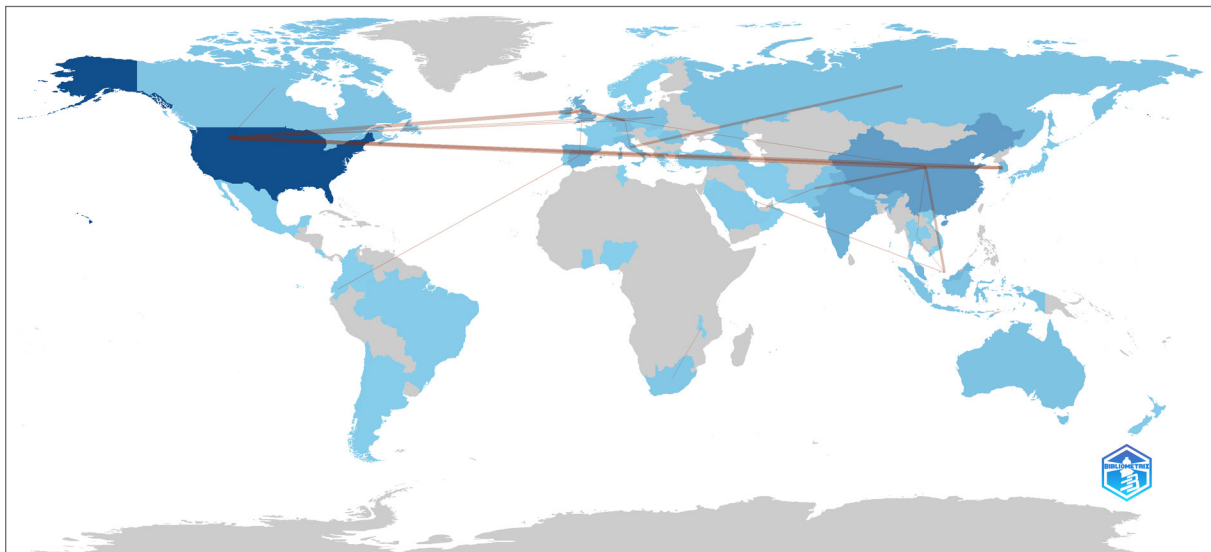
Source: authors' editing

This pattern aligns with findings from bibliometric studies, which suggest that barriers such as funding restrictions, language differences, and institutional priorities often hinder cross-border academic cooperation. As a result, much of the research in this field is shaped by regional economic and labor market conditions rather than by a globally integrated perspective.

The fragmentation of co-authorship networks suggests an opportunity for future research efforts to foster greater international collaboration, particularly in exploring universal aspects of job satisfaction, employee motivation, and labor market trends. Encouraging interdisciplinary and cross-border partnerships could enhance the depth and applicability of research findings, contributing to a more comprehensive understanding of human capital development across different economic and cultural contexts.

Implications and recommendations

The findings of this bibliometric analysis underscore both the growing complexity and the evolving significance of human capital and job satisfaction research from 2019 to 2024. Despite early expectations of a steady upward trajectory in publication counts (Lenihan et al., 2019), real-world events—most notably the COVID-19 pandemic—led to fluctuations in scholarly output. Furthermore, a small cluster of highly cited works exerts considerable influence over theoretical and empirical discourse in this domain, suggesting that a limited number of "cornerstone" articles continue to shape ongoing debates and guide future investigations (Solomon et al., 2021). The

co-occurrence of keywords such as "turnover intention," "organizational commitment," and "employee motivation" alongside "job satisfaction" highlights their interconnectedness, aligning with broader trends in human resource management and organizational psychology (Judge et al., 2001; Meyer, & Allen, 1991). Nonetheless, the co-authorship analysis reveals fragmented collaboration networks, implying relatively narrow academic partnerships and limited knowledge exchange across borders (Lenihan et al., 2019; Schmidt et al., 1998).

Despite these insights, certain limitations must be acknowledged. First, using a single database (Web of Science Core Collection) and restricting the time window to 2019–2024 narrows the breadth of literature examined, potentially overlooking relevant research published in earlier or slightly overlapping periods (Teixeira, & Fortuna, 2004). Second, focusing solely on English-language, peer-reviewed journal articles excludes work that may be published in other languages or formats, which can be especially significant in exploring global perspectives on human capital and job satisfaction (OECD, 2019). Third, the pandemic-induced disruptions to publication cycles and research funding (Myers et al., 2020; Korbel, & Stegle, 2020) complicate longitudinal comparisons, as spikes or dips in publication counts may reflect external constraints rather than a true shift in scholarly emphasis.

With regard to research gaps, two primary areas stand out. One concerns the need for broader international and interdisciplinary collaboration. Given that co-authorship clusters remain largely region- or institution-specific, expanding partnerships across countries and academic fields could yield deeper insight into universal aspects of workplace well-being, remote work, and human capital development (Zupic, & Čater, 2015; Spurk, & Straub, 2020). Another gap centers on methodological diversity: bibliometric evidence suggests a reliance on quantitative frameworks, pointing to the potential value of qualitative or mixed-methods approaches that investigate nuanced issue – such as sociocultural influences or psychological drivers – in shaping job satisfaction and human capital outcomes (Brynjolfsson et al., 2020; Carnevale, & Hatak, 2020). Addressing these gaps would not only foster a more comprehensive understanding of how human capital policies intersect with workplace satisfaction but also stimulate new research avenues capable of informing policymaking and organizational strategies in a rapidly shifting economic landscape.

References

Acemoglu, D., & Autor, D. (2011). Skills, tasks and technologies: Implications for employment and earnings. *Handbook of Labor Economics, 4*, 1043-1171.

Bachrach, D. G., Lewis, K., Kim, Y., Patel, P. C., & Campion, M. A. (2021). Transactive memory systems in context: A meta-analytic review. *Journal of Applied Psychology, 104*(3), 464-493. https://doi.org/10.1037/apl0000329.

Becker, G. S. (1993). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education.* University of Chicago Press, Chicago. https://doi.org/10.7208/chicago/9780226041223.001.0001.

Brynjolfsson, E., Horton, J. J., Ozimek, A., Rock, D., Sharma, G. & TuYe, H. Y. (2020). *COVID-19 and remote work: An early look at US data.* National Bureau of Economic Research, Working Paper No. 27344.

Carnevale, J. B., & Hatak, I. (2020). Employee adjustment and well-being in the era of COVID-19: Implications for human resource management. *Journal of Business Research, 116*, 183-187.

Card, D., Kluve, J. & Weber, A. (2018). What works? A meta-analysis of recent active labor market program evaluations. *Journal of the European Economic Association, 16*(3), 894-931. https://doi.org/10.1093/jeea/jvx028.

Dachner, A. M., Ellingson, J. E., Noe, R. A., & Saxton, B. M. (2021). The future of employee development. *Human Resource Management Review, 27*(2). https://doi.org/10.1016/j.hrmr.2019.100732.

Herzberg, F. (1966). *Work and the Nature of Man.* World Publishing, Cleveland.

Judge, T. A., Thoresen, C. J., Bono, J. E. & Patton, G. K. (2001). The job satisfaction – job performance relationship: A qualitative and quantitative review. *Psychological Bulletin, 127*(3), 376-407. https://doi.org/10.1037/0033-2909.127.3.376

Kniffin, K. M., Narayanan, J., Anseel, F., Antonakis, J., Ashford, S. P., Bakker, A. B., Bamberger, P., Bapuji, H., Bhave, D. P., Choi, V. K., Creary, S. J., Demerouti, E., Flynn, F. J., Gelfand, M. J., Greer, L. L., Johns, G., Kesebir, S., Klein, P. G., Lee, S. Y., Ozcelik, H., Petriglieri, J. L., Rothbard, N. P., Rudolph, C. W., Shaw, J. D., Sirola, N., Wanberg, C. R., Whillans, A., Wilmot, M. P., & Vugt, M. V. (2021). COVID-19 and the workplace: Implications, issues, and insights for future research and action. *The American psychologist, 76*(1), 63-77. https://doi.org/10.1037/amp0000716.

Korbel, J. O., & Stegle, O. (2020). Effects of the COVID-19 pandemic on life scientists. *Genome Biology, 21*(1), 113.

Kuvaas, B., & Dysvik, A. (2009). Perceived investment in employee development, intrinsic motivation and work performance. *Human Resource Management Journal, 19*(3), 217-236. https://doi.org/10.1111/j.1748-8583.2009.00103.x.

Lenihan, H., McGuirk, H., & Murphy, K. (2019). Driving innovation: Public policy and human capital. *Research Policy, 48*(9), 1. https://doi.org/10.1016/j.respol.2019.04.015.

Meyer, J. P., & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review, 1*(1), 61-89. https://doi.org/10.1016/1053-4822(91)90011-Z.

Meyer, J. P., & Herscovitch, L. (2001). Commitment in the Workplace: Toward a General Model. *Human Resource Management Review. 11*(3), 299-326. https://doi.org/10.1016/S1053-4822(00)00053-X.

Myers, K. R., Tham, W. Y., Yin, Y., Cohodes, N., Thursby, J. G., Thursby, M. C., Schiffer, P., Walsh, J. T., Lakhani, K. R., & Wang, D. (2020). Unequal effects of the COVID-19 pandemic on scientists. *Nature Human Behaviour, 4*, 880-883. DOI: 10.1038/s41562-020-0921-y.

OECD (2019). *OECD Employment Outlook 2019: The Future of Work*. Paris: OECD Publishing. https://doi.org/10.1787/9ee00155-en.

Otti C., Szabó S., & Fehér A. (2025). Az MI alkalmazása a jelen és a jövő HR-jében. *Új Munkaügyi Szemle, 6*(2), 17-24. https://doi.org/10.58269/umsz.2025.2.2.

Papp-Váry Á., Hajnal M., & Czeglédi Cs. (2020). A személyes márkázás hatása a karrierépítésre: Egy egyetemi hallgatók körében végzett primer kutatás eredményei. *Új Munkaügyi Szemle, 4*(1), 58-71.

Ramos-Villagrasa, P. J., Marques-Quinteiro, P., Navarro, J., & Rico, R. (2017). Teams as Complex Adaptive Systems: Reviewing 17 Years of Research. *Small Group Research. 49*(2), 135-176. https://doi.org/10.1177/1046496417713849.

Redin, C. I., & Erro-Garcés, A. (2022). Stress in teaching professionals across Europe. *International Journal of Educational Research, 103*, 101623.

Schmidt, F., & Hunter, J. (1998). The Validity and Utility of Selection Methods in Personnel Psychology. *Psychological Bulletin. 124*(2), 262-274. https://doi.org/10.1037/0033-2909.124.2.262.

Solomon, B. C., Nikolaev, B. N., & Shepherd, D. A. (2021). Does Educational Attainment Promote Job Satisfaction? The Bittersweet Trade-offs Between Job Resources, Demands, and Stress. *Journal of Applied Psychology, 107*(7), 1227-1241. http://dx.doi.org/10.1037/apl0000904.

Spurk, D., & Straub, C. (2020). Flexible employment relationships and careers in times of the COVID-19 pandemic. *Journal of Vocational Behavior, 119*, 103435. https://doi.org/10.1016/j.jvb.2020.103435

Teixeira, A. A. C., & Natercia F. (2004). Human capital, innovation capability and economic growth in Portugal 1960-2001. *Portuguese Economic Journal, Springer; Instituto Superior de Economia e Gestao, 3*(3), 205-225. https://doi.org/10.1007/s10258-004-0037-8

Zupic, I., & Čater, T. (2015). Bibliometric Methods in Management and Organization. *Organizational Research Methods. 18*(3), 429-472. https://doi.org/10.1177/1094428114562629.