

Bibliometric Analysis of Talent Development Through Mentoring

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ABSTRACT

This study aims to analyze the trends, patterns, and contributions of mentoring to talent development through a bibliometric approach. The analysis is conducted using various national and international literature that explores the relationship between mentoring programs and talent development across different contexts, including education, organizations, and professional development. The findings indicate that mentoring plays a significant role in enhancing the skills and competencies of human resources. To support the analysis, VOSviewer software was utilized to visualize keyword networks, author collaborations, and publication trends. This study is expected to provide a comprehensive overview of the strategic role of mentoring in sustainable talent development.

Keywords: *Mentoring, Talent Development Bibliometric Analysis, Human Resource Development, VOS Viewer, Professional Growth*

1. INTRODUCTION

Mentorship plays a vital role in talent development, and its significance in both academic and professional environments has garnered increasing attention in recent years. According to several studies, mentorship not only fosters skill enhancement but also provides invaluable support for career advancement, which is crucial for organizational growth [1][2]. The development of talent through mentorship is often considered a strategic tool for retaining skilled individuals and enhancing their overall potential [3]. This process is seen as a reciprocal relationship where the mentor guides the mentee through personal, academic, and professional growth, thus benefiting both individuals and organizations [4].

One of the most critical aspects of mentorship is its impact on leadership development and organizational culture. As noted by [5], mentorship helps cultivate leadership skills, fosters innovation, and enhances organizational performance. Additionally, mentorship is considered a powerful mechanism for addressing gaps in knowledge and promoting collaborative learning within organizations [6]. Several scholars, including [6], argue that organizations that implement structured mentorship programs experience increased employee satisfaction, retention, and performance.

Despite its well-documented advantages, mentorship, particularly its role in talent development, remains an area that requires further exploration. While there is an abundance of literature discussing the benefits and effectiveness of mentorship, few studies have utilized bibliometric approaches to comprehensively analyze the evolution and trends of mentorship research in talent development [7][8]. The need for such studies has been highlighted by [9], who noted the lack of detailed analyses that explore the changing dynamics of mentorship in a rapidly evolving professional landscape.

This study aims to address these gaps by conducting a bibliometric analysis of the existing literature on mentorship and talent development. The key objectives of this research include:

1. Classifying the literature on mentorship and its role in talent development.

2. Identifying emerging trends in mentorship research, specifically in the context of talent development.
3. Analyzing the most frequently discussed topics in mentorship and talent development literature.
4. Highlighting potential areas for future research in the field of mentorship and talent development.

Through this bibliometric approach, the study seeks to provide a comprehensive overview of the mentorship landscape, offering insights that will be valuable for both academic researchers and practitioners involved in talent development programs. The findings of this study will contribute to a deeper understanding of how mentorship shapes talent development processes and help guide future research directions.

2. METHODS

This study, bibliometric analysis is utilized to examine the evolution of research in a specific field through scientific publications. This method enables researchers to identify research trends, connections between scholarly works, and the impact of a topic within academic literature. The stages of the bibliometric analysis approach implemented in this study are outlined as follows.

2.1 Data Collection

relevant publications were gathered using the Publish or Perish software, which extracts bibliographic data from crossref & Google Scholar. This platform was selected due to its wide coverage of academic outputs, including peer-reviewed journal articles, theses, and conference proceedings. The keyword combinations used in the search strategy included: “talent development”, “mentoring”, “mentorship”, and “career development”, connected using OR. The inclusion criteria were publications written in English, published between 2010 and 2025, and directly related to the topics of human resource development, education, or organizational behavior. Publications that were not academically peer-reviewed, unrelated to mentoring or talent development, or duplicates were excluded from the dataset.

2.2 Bibliometric Indicators

Bibliometric indicators were selected to measure and analyze the data collected on talent development through mentoring. These indicators included the number of publications per year to examine research growth over time, citation analysis to identify the most influential authors and articles, keyword co-occurrence analysis to detect the central themes in the literature, and co-authorship analysis to explore collaborative relationships among researchers. These bibliometric measures are crucial in mapping the structural dynamics and evolution of this research field.

After collecting the data, the next step was to define the analysis criteria for evaluating the retrieved publications. In this study, bibliometric analysis was used to investigate how the topic of talent development through mentoring has evolved across academic literature. Trends in publication output were analyzed to highlight key periods of increased scholarly attention. Furthermore, citation relationships among articles were assessed to determine the underlying theoretical foundations influencing the field.

2.3 Data Visualization

To support the analysis, data visualization was conducted using VOSviewer, a bibliometric mapping tool that transforms raw bibliographic data into graphical visualizations. The software was used to create several types of maps, including network maps of keyword co-occurrence, density maps showing the frequency and weight of terms, and overlay maps displaying the chronological

development of research topics. These visualizations allowed for the identification of major research clusters and emerging areas within the scope of mentoring and talent development.

2.4 Interpretation and Implications

Finally, in the interpretation and implications stage, the findings were analyzed to draw an insightful conclusion. The results highlighted dominant themes such as leadership development, employee engagement, mentoring effectiveness, and career advancement. In addition, emerging themes such as digital mentoring, cross- generational mentorship, and mentorship for diversity and inclusion were identified. These insights offer practical implications for organizations seeking to enhance their talent strategies and contribute to future academic exploration by identifying under-researched areas within the field.

2.5 Stages of Bibliometric Analysis

The steps involved in the bibliometric analysis paper are illustrated in Figure 1.

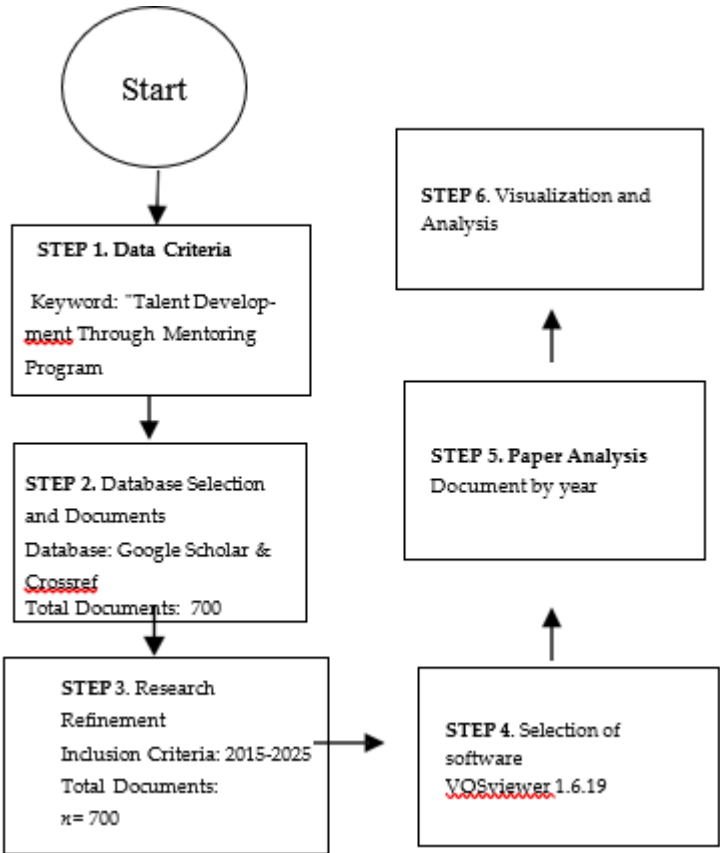


Figure 1. Stages of Bibliometric Analysis.

3. RESULTS AND DISCUSSION

3.1 Publication Trend Analysis

A search for publications on "Talent Development through Mentoring" in Google Scholar and CrossRef databases revealed around 700 articles published between 2015 and 2025. The analysis of publication trends shows a notable increase in research on talent development through mentoring over the last two decades. This growing interest is mainly driven by the increasing recognition of mentoring as a crucial element in talent management and leadership development within organizations. The focus on employee growth, succession planning, and fostering inclusive work environments has contributed significantly to the rise in studies on this topic.

Much of the existing literature examines the impact of mentoring on career progression, skills development, leadership capabilities, and employee engagement. Mentoring's role in promoting diversity and inclusion is also frequently discussed, especially in sectors like technology, healthcare, and business management. These studies highlight the importance of mentoring programs in facilitating professional growth for underrepresented groups. Qualitative research, such as interviews, case studies, and focus groups, remains the most common approach, as it captures the relational aspects of mentoring. However, quantitative studies also contribute by evaluating the direct outcomes of mentoring on career success, job satisfaction, and employee retention.

While the field has expanded, some gaps remain, particularly regarding the long-term effects of mentoring on job commitment and career development.

Research that investigates how mentoring influences these factors over time is still limited. Emerging trends in the literature include the exploration of virtual mentoring and its effectiveness in remote and global work environments.

As digital platforms become more prominent, understanding how these models compare to traditional face-to-face mentoring is an area for future research. Additionally, the role of organizational culture and leadership in shaping successful mentoring programs is becoming a significant focus. Effective mentoring is often tied to leadership support and a culture that values employee development. Research is increasingly examining how leadership can drive the success of mentoring programs within organizations. Lastly, there is a growing interest in cross-cultural mentoring research, as global workplaces require tailored mentoring strategies that align with different cultural expectations.

Understanding how mentoring is perceived in diverse contexts can enhance the relevance and success of these programs. Further studies are needed to explore different mentoring models and their long-term effects on both individual and organizational outcomes.

No	Author	Research Objectives	Location	Methodology	Findings
1	[1]	The project aimed to establish a structured mentoring framework to enhance talent development within the Learning Development (LD) community. By recognising the value of mentoring, the initiative sought to create opportunities for individuals to refine their skills, expand their expertise, and build professional confidence through mentor-mentee relationships.	United Kingdom (universities affiliated with ALDinHE)	A participatory session was held to present the mentoring scheme, showcase supporting materials, and facilitate open discussions. Informal feedback from attendees was gathered to understand perceptions and experiences with mentoring.	They highlighted the role of mentoring as a catalyst for talent development within the LD field. Participants reported increased motivation, greater clarity regarding their professional pathways, and a deeper appreciation of mentoring as a tool for skill enhancement. The session successfully fostered a supportive environment that encouraged reflection, collaboration, and professional growth among the community members.

2	[7]	The aim of this study is to analyze the extent to which the mentoring programs implemented at Sekolah Bisnis Muda (SBM) Bogor and Sekolah Muda Mandiri (SMM) Semarang support the talent development of adolescents. The focus is on how these programs contribute to the growth of business and personal skills in students, with an emphasis on Islamic-based mentoring methods for developing talents in business and other areas.	Indonesia	This research adopts a qualitative field study approach to describe the Islamic mentoring programs at SBM and SMM. Data was gathered through direct interviews with informants, observations, and document analysis. The study was conducted between March and October 2023, involving students and mentoring teachers from both institutions.	Mentoring program at SBM Bogor effectively facilitated the development of students' business talents through Islamic-based guidance. However, at SMM Semarang, while the program helped students easily understand Islamic material, it was less effective in fostering talent development. Both programs addressed issues related to worship, ethics, and morality, but they fell short in fully meeting the needs for talent development in students.
3	[5]	This Journals aims to explore the impact of talent development mentorship on employee performance, particularly examining the moderating effect of organizational culture. The research seeks to assess how mentorship practices influence employees' abilities to achieve their goals and perform effectively within organizations.	Kenya	The Journal utilized a cross-sectional survey design, collecting data through questionnaires from employees. It employed descriptive and inferential statistics, specifically regression analysis, to test the relationship between talent development mentorship and employee performance, with organizational culture as a moderating variable.	The Journal found a significant relationship between talent development mentorship and employee performance, demonstrating that organizational culture plays a moderating role in this relationship. The results suggest that mentorship practices, when aligned with organizational culture, contribute to better employee performance, highlighting the need for organizations to integrate mentorship into their strategy for enhancing employee outcomes.

4	[10]	This paper explores the role of training transfer and mentoring in developing youth leadership. It examines how these programs enhance leadership skills and how skills are applied in real-world contexts to improve individual and organizational performance. The study also identifies challenges and expectations for youth leadership in the development process.	Malaysia	A qualitative approach was used to examine the impact of training transfer and mentoring on youth leadership development. Data were collected from secondary research, focusing on how these programs contribute to leadership skills development and organizational strategies for integrating training and mentoring.	The paper found that training transfer is essential for developing leadership skills by enabling youth to apply their knowledge effectively. Mentoring was also critical in supporting leadership development. Challenges such as insufficient organizational support and limited practical opportunities hindered the effectiveness of these programs.
5	[11]	This journal investigates the development of a reliable instrument to measure mentoring's impact on lifelong learning competencies in higher education. The goal is to provide a valid and theoretically grounded tool for assessing mentoring programs, which have become a key method for promoting skills like critical thinking and problem-solving among students. The research also aims to address the lack of standardized, validated measures in the field of mentoring and to provide insights into how different types of support, such as emotional and career support, contribute to students' learning outcomes	Netherlands	The journal developed a 35-item questionnaire to assess mentoring programs, grounded in a comprehensive literature review. The instrument was validated through exploratory factor analysis (n = 225), confirmatory factor analysis (n = 208), and cross-validation (n = 101) in four higher education institutions. The data were analyzed to ensure the model's validity and reliability for use in academic mentoring programs.	It support the development of a 21-item, six-factor model, demonstrating the reliability and validity of the Mentoring Support Scale. The study identifies various types of mentor support—such as psychosocial, emotional, career, autonomy, and networking support—as critical elements in mentoring programs. The results show that these types of support significantly contribute to the development of lifelong learning competencies in students, with each type of support having distinct roles in fostering student success and career preparation.

6	[12]	This Journal aims to explore the role of mentoring in supporting leadership development, specifically within clinical psychology, and to assess its impact on enhancing leadership skills and professional growth for psychologists at different career stages.	United Kingdom	The Journal used a mixed-method approach, involving both quantitative surveys and qualitative feedback from mentees and mentors participating in mentoring programs. Data was collected through a self-matching system, with feedback gathered from 39 mentoring pairs.	The Journal found that mentoring positively impacted leadership skills, with significant improvements in leadership abilities reported by mentees. Mentoring also contributed to personal and professional development, and the majority of participants expressed high satisfaction. Additionally, the study highlighted challenges faced by minority groups in assuming leadership roles and emphasized the need for tailored support and resources to address these barriers.
7	[13]	To investigate the impact of leadership development programs, mentorship, and employee empowerment on organizational performance.	Indonesia	Quantitative analysis through surveys to assess the relationship between leadership programs, mentorship, and organizational performance.	This paper found a Strong correlation between leadership development, employee empowerment, and improved organizational performance.
8	[14]	To explore how social constructivist mentoring practices enhance the professionalism of English academic writing teachers at private universities in Central Java, Indonesia.	Indonesia	Qualitative approach using action research, with teachers engaged in a mentoring cycle of planning, acting, observing, and reflecting to improve their teaching practices.	Mentoring led to transformative changes in teaching practices, positively impacted students, and highlighted key barriers to learning, with teachers showing improved professionalism and increased engagement in the educational process.
9	[15]	To examine the effectiveness of peer mentoring in supporting African American leaders and how it promotes identity work, including enabling perspectives, empathic acknowledgment, and containment within a	United States	A qualitative approach using peer mentoring circles as part of an executive leadership development program. Data was collected through interviews, focus groups, and ongoing evaluations during the program.	Peer mentoring provided a safe space for leaders to explore identity, address racial issues, and receive critical validation and support. Over time, the mentoring relationships evolved to focus more on leadership

		formal mentoring program.			development and personal growth, with a noticeable increase in trust and shared experiences among participants.
10	[16]	The article explores how mentoring and leadership development in Christian contexts can be guided by Social Learning Theory. It aims to understand how leaders can model Christian leadership and influence others through mentoring relationships.	USA	The article applies Social Learning Theory, drawing from Albert Bandura's framework of observational learning, where leaders model behaviors for followers to imitate. The theoretical approach is supported by biblical examples and scholarly literature.	The article argues that leadership development occurs effectively when modeled by leaders who engage in intentional mentoring. Social learning theory helps refine this process, making leadership behaviors more observable and replicable by followers, fostering leadership development through modeling in relational settings.
11	[17]	To investigate existing mentoring programs for medical students, identifying program types, objectives, and reported outcomes.	Swiss	From a literature search on PubMed (2000-2008) focusing on structured mentoring programs and student surveys.	Mentoring programs focus on career counseling, professionalism, research, and personal growth. Positive effects include better career decisions, research productivity, and improved well-being. Successful mentoring requires active roles for both mentors and mentees.

The publication trend from 2015 to 2025 illustrates a clear and dynamic evolution in scholarly attention toward the topic of talent development through mentoring. In the early years particularly 2015 through 2017 the number of publications was relatively limited, reflecting the nascent stage of academic exploration in this field. During this period, contributions were sporadic, with only a modest number of studies published annually. This suggests that while the topic had begun to attract interest, it had not yet gained widespread traction within academic circles.

A noticeable shift occurred starting in 2018, where publication frequency began to rise more steadily. This upward trajectory indicates that researchers and practitioners increasingly recognized the value of mentoring as a strategic tool for developing talent, particularly within the domains of human resource management, leadership development, and educational contexts. The momentum continued to build, culminating in a peak between 2021 and 2022. This period marked the highest volume of scholarly output on the topic, suggesting that mentoring—especially in response to global changes in the workplace and education systems—had become a critical area of focus.

The post-2020 surge may be partially attributed to the shift toward hybrid and remote work environments, prompting a need for virtual mentoring models and adaptive talent strategies. Furthermore, increased attention to employee engagement, retention, and succession planning likely contributed to the topic's heightened relevance. Interestingly, data from 2025 indicate a slight decline in publication volume. However, this trend may not reflect reduced interest, but rather the incomplete nature of the current year's indexing or a natural plateau as the field matures.

Overall, the upward trend over the past decade highlights a significant and growing commitment within the academic community to examine and enhance mentoring practices as a central element in talent development. This trajectory not only reflects the topic's increasing academic credibility but also its practical importance across organizational and educational landscapes.

3.2 Interconnected Research Themes

Figure 2 generated using VOS Viewer, presents a network visualization map that displays the co-occurrence relationships among keywords in the literature on talent development through mentoring. The visualization highlights how terms are connected across different thematic areas. The term "development" occupies the central position, serving as the core concept around which most other keywords are clustered. On the left side of the map, terms such as "talent development", "talent management", "review", and "succession planning" form a cohesive cluster. This cluster reflects the organizational focus of mentoring, particularly in developing future leaders and aligning individual potential with long-term institutional goals.

On the right side of the map, we observe a distinct cluster around the terms "mentorship", "mentor", and "relationship", emphasizing the human and relational aspects of mentoring. This suggests a sustained academic interest in understanding the dynamics between mentors and mentees and their impact on professional growth. The visual proximity and linkage between these terms demonstrate the multidisciplinary integration of mentoring concepts across fields such as human resources, education, and leadership development.

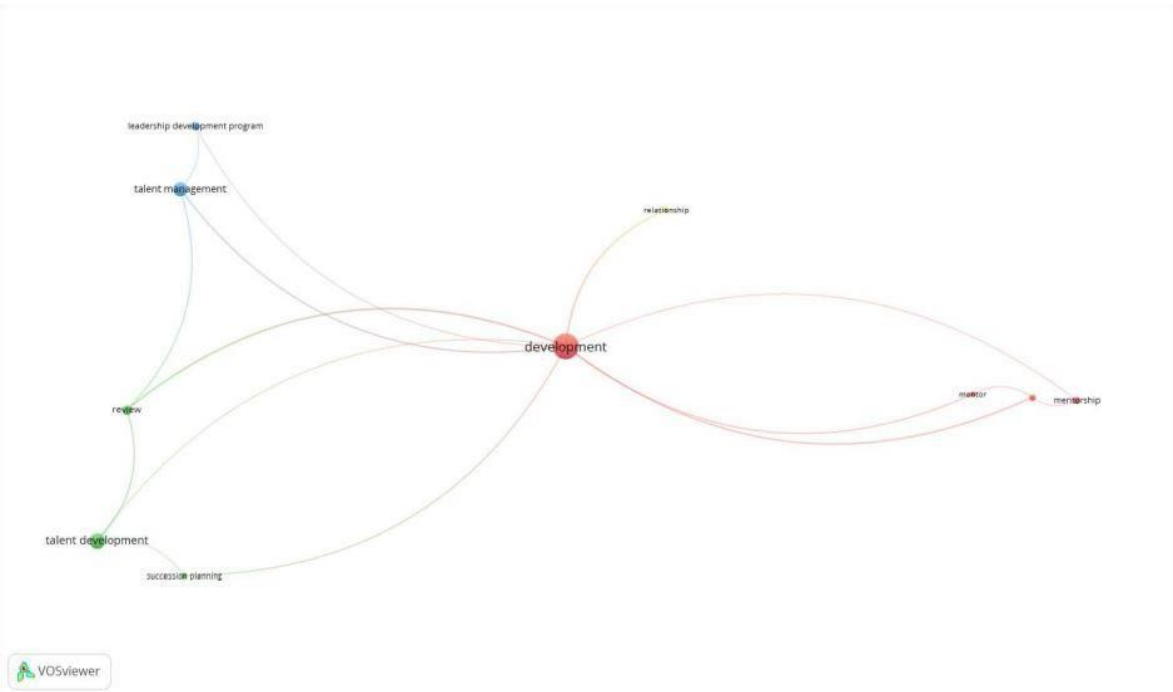


Figure 2. Network Visualization

Figure 3 provides a density visualization of the same keyword data, illustrating the frequency and focus intensity of specific terms through color gradients. The bright yellow center

around the keyword "development" indicates it as the most frequently used and central term in the dataset. Other notable high-density areas include "talent development", "leadership development program", and "mentorship", which appear in bright green, suggesting a concentrated body of research in these areas.

The spread of density across various thematic clusters shows that research on talent development through mentoring is not limited to one perspective but spans multiple domains. While traditional themes like succession planning and talent management remain prominent, newer areas like mentoring relationships and leadership pipelines are emerging with increasing scholarly attention. This visualization helps to identify well-established domains and also spot potential gaps for future investigation, particularly in the integration of mentoring with digital tools and inclusive development strategies.

Table 2. Identified Clusters and Associated Keyword

Cluster	Total Number of Items	Most Frequent Keywords (Occurrences)
1	4	Development, Mentor, Mentorship, Opportunity
2	3	Review, Succession Planning, Talent Development
3	2	Leadership Development Program, Talent Management
4	1	Relationship

Cluster 1 includes key terms such as "talent development," "talent management," "succession planning," and "review". This cluster reflects a strong emphasis on the strategic role of mentoring in long-term workforce planning. Studies in this area often focus on how structured mentoring initiatives support leadership pipelines, internal talent mobility, and organizational continuity. The presence of "review" suggests that systematic evaluations and evidence-based approaches are integral to understanding the effectiveness of these programs.

Cluster 2 is composed of keywords such as "leadership development program" and "talent management", indicating that mentoring is frequently framed as a tool for cultivating leadership capabilities. These studies emphasize how mentoring helps identify and groom high-potential individuals, preparing them for critical leadership roles. This theme also aligns with the increasing demand for future-ready leaders who are adaptable, collaborative, and skilled in guiding teams through Cluster 3 highlights the terms "mentor," "mentorship," and "relationship", pointing to the interpersonal dimension of mentoring. Research within this theme focuses on the dynamics between mentor and mentee, exploring how trust, communication, and guidance influence individual growth and learning. It also includes studies that address cross-generational mentoring, peer mentoring, and the psychological safety required for mentoring to be effective. These relationships are often central to personal development, especially in educational or early-career contexts.

Cluster 4 revolves around the keyword "development", which functions as the conceptual core of the field. All other clusters converge around this central term, highlighting its importance in linking mentoring to outcomes such as skill enhancement, career advancement, and organizational learning. The term also anchors broader themes like innovation, continuous improvement, and capacity building.

The presence of clearly defined thematic clusters in the network visualization suggests that research on talent development through mentoring is both multidimensional and interdisciplinary. These clusters span across domains such as strategic human resource development, leadership cultivation, organizational succession planning, and mentoring relationships indicating that this topic is not isolated to one academic perspective but draws from various fields including business management, education, psychology, and organizational behavior.

This dynamic reflects a growing recognition that mentoring is not merely a soft skill intervention, but a structured and strategic component of workforce planning and professional growth. By mapping the connections between key terms such as talent development, leadership development program, mentor, and succession planning, it becomes clear that mentoring is often positioned at the intersection of individual learning and institutional performance.

Moreover, the emphasis on relational keywords such as mentor, mentorship, and relationship highlights the psychosocial dimension of development. These interpersonal connections play a vital role in enhancing motivation, building trust, and fostering a sense of belonging factors that are increasingly linked to employee retention and engagement. As organizations seek to remain agile and competitive, these human-centered strategies become even more crucial.

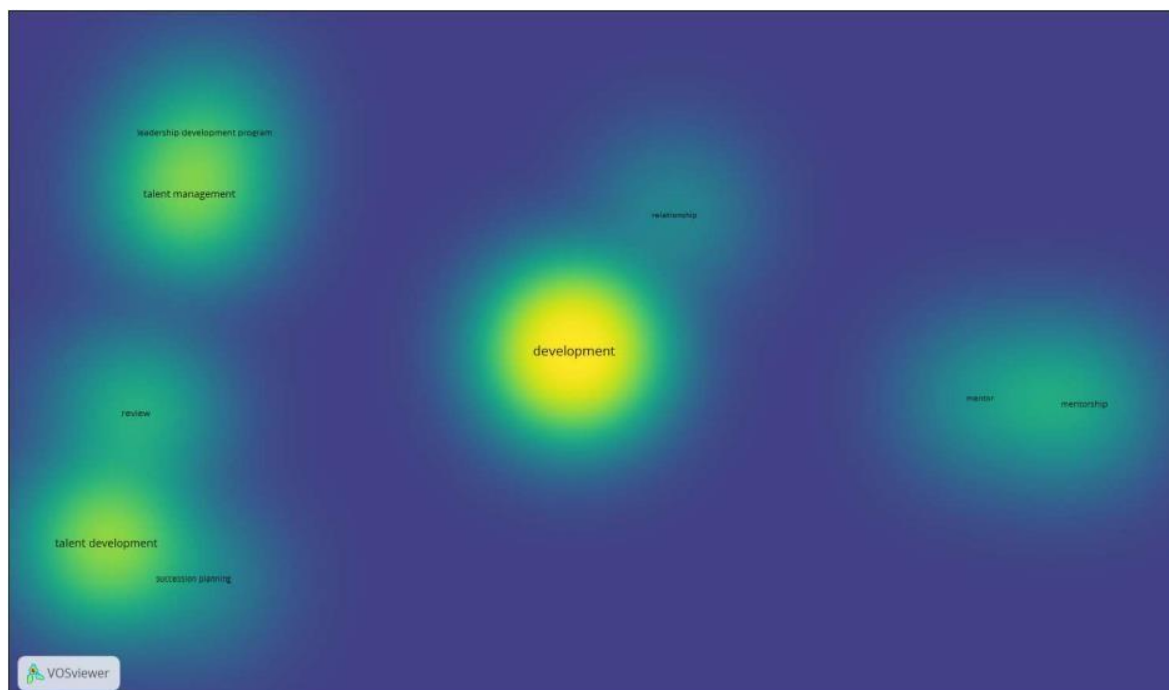


Figure 3. Density Visualization

Figure 3 presents a density visualization generated using VOSviewer, showcasing the distribution and intensity of co-occurring keywords associated with the theme Talent Development through Mentoring. In this map, the keyword “development” is positioned at the center and highlighted in bright yellow, indicating its dominant presence and high level of connectivity with other keywords across the analyzed literature. This signifies that “development” is a central and frequently explored concept in discussions related to mentoring and talent strategies.

Surrounding this core term, several important clusters emerge. In the lower-left region, keywords such as “talent development”, “succession planning”, and “review” suggest a strategic focus on long- term talent pipeline management and reflective evaluation of mentoring outcomes. These terms are commonly associated with literature discussing organizational readiness, leadership continuity, and structured development programs within corporate and educational contexts.

The upper-left quadrant features keywords like “leadership development program” and “talent management”, indicating the intersection of mentoring with leadership cultivation and strategic HR practices. This reinforces the understanding that mentoring is frequently utilized not only to support individual growth but also as a deliberate tool to enhance organizational performance and leadership capacity.

On the right side of the visualization, another distinct area of concentration involves keywords such as “mentor”, “mentorship”, and “relationship”, pointing to the interpersonal and relational dimension of mentoring. These terms reflect the human-centered aspect of the literature,

focusing on the dynamics between mentors and mentees, the importance of trust, and the role of mentoring relationships in shaping career and personal development outcomes.

Collectively, this density visualization illustrates that the research landscape surrounding talent development through mentoring is both diverse and interconnected. It emphasizes that effective mentoring contributes simultaneously to personal career trajectories and broader institutional objectives.

CONCLUSION

This research highlights the dynamic and interconnected nature of talent development through mentoring, demonstrating its essential function in both individual advancement and broader organizational growth. Utilizing a bibliometric analysis approach, the study successfully mapped key areas of scholarly focus, including leadership preparation, succession initiatives, mentoring relationships, and strategic talent management. These focal points suggest that mentoring is not only a tool for personal enrichment but also a central component in developing sustainable human capital systems.

Findings from the data reveal that mentoring contributes significantly to organizational success by fostering employee development, enhancing engagement, and facilitating leadership readiness. The strong emphasis on interpersonal dynamics between mentors and mentees also points to the value of relational trust and continuous support in achieving developmental outcomes. Additionally, the visual and thematic analysis highlighted emerging directions in mentoring research, such as digital mentorship platforms, inclusive mentoring for diverse talent groups, and strategies adapted to hybrid work environments.

This study underlines the importance of drawing upon insights from multiple disciplines ranging from human resource development and educational management to organizational psychology to better understand and implement effective mentoring systems. The results can inform not only academic pursuits but also practical applications in workplace settings. By leveraging these insights, organizations and institutions can create mentoring frameworks that are purpose-driven, inclusive, and responsive to current talent development needs. Supporting well-structured mentoring programs ultimately helps create environments where individuals can grow with confidence, contribute meaningfully, and become future leaders.

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