

## REVIEW ARTICLE

# Transformational leadership and knowledge sharing: Science mapping of present and future trends

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## ABSTRACT

This study explores and synthesizes the knowledge structure of transformational leadership on knowledge sharing. Transformational leadership has been widely recognized as an effective approach for fostering knowledge sharing among individuals within organizations, although its impact may vary depending on contextual factors. Through a science mapping analysis, this study reviews the fundamental knowledge structure in the Web of Science (WoS) database to uncover the current and future trends of transformational leadership and knowledge sharing. A total of 441 documents were retrieved from the Web of Science (WoS), spanning the years 2006 to 2024. The current trends produced by bibliographic coupling analysis depicted three clusters: Leadership influence on employees' creativity, social capital and knowledge sharing behavior, and innovation capability through transformational leadership. At the same time, the future trends produced by co-word analysis suggest three themes associated with 1) firm performance, 2) innovation and creativity, and 3) fostering of trust, absorptive capacity, and self-efficacy through transformational leadership. Implications suggest that transformational leadership is one of the most effective leadership styles that encourages followers' knowledge sharing behavior, among other constructive leadership styles, such as servant transactional leadership, servant leadership, and authentic leadership. Organizations need to develop transformational leadership among their leaders to ensure that followers can follow and replicate the ideas of their leaders. This study is among the first to present the knowledge structure on transformational leadership and its relationship with knowledge sharing.

**Keywords:** transformational leadership; knowledge sharing behavior; employee creativity; innovation behavior

## 1. Introduction

Leaders shape the work environment by making subordinates and followers feel secure and motivated. Leaders promote knowledge networks, multiply social ties among employees, foster cross-functional teams,

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and catalyze formal mechanisms to enhance upward communication<sup>[1]</sup>. Ballesteros-Rodríguez et al.<sup>[2]</sup> reveals that a knowledge-oriented leadership style predicts knowledge sharing among team members. Knowledge sharing is crucial in an organization for organizational learning to develop the knowledge base and become competitive in today's challenging business market<sup>[3,4]</sup>. Among the many leadership styles, one stands out as a practical approach to encouraging positive work behavior, including knowledge sharing, as a productive behavior within the organization: transformational leadership. It has been proven in the literature to encourage followers to share knowledge freely without fear of losing knowledge power<sup>[5]</sup>.

Transformational leaders transform followers through their idealized influence, intellectual stimulation, inspiration, and individualized consideration<sup>[6]</sup>. In other words, transformational leaders create an empowered working environment by ensuring followers achieve high performance through excellent role models (idealized influence), communicating purposes and expectations (inspirational motivation), promoting rationality and intelligence (intellectual stimulation), and providing personal attention to subordinates (individualized consideration)<sup>[7]</sup>. Through transformational leadership, followers' maturity will increase, and their ability to generate ideas and foster creativity will be developed. Followers will be concerned with achieving success, securing well-being, and cultivating their self-actualization for the betterment of the organization and society. Knowledge sharing is crucial in organizations, where individuals are expected to share their expertise for collective benefits<sup>[5]</sup>. Transformational leadership has proven to be an enabler for employees' knowledge sharing behavior in the organization<sup>[8]</sup>.

Kim and Park<sup>[9]</sup> asserted that transformational leadership provides a positive response to organizational climate, leading to organizational learning and knowledge sharing. Son et al.<sup>[4]</sup> highlighted the importance of organizational engagement with transformational leadership as it stimulates employees' knowledge-sharing behavior as a crucial predictor of organizational performance. This leadership has also been shown to unearth employees' innovativeness<sup>[10,11]</sup>. Transformational leadership has also been shown to be a crucial moderator in different relationships. For instance, Phung et al.<sup>[12]</sup> discovered that it positively moderated the relationship between trust, subjective norm, and knowledge self-efficacy toward knowledge-sharing behavior. Gui et al.<sup>[13]</sup> revealed that knowledge-sharing acts as a mediator in the relationship between transformational leadership and two innovation capabilities (radical and incremental).

Two main reasons motivated this study. First, the crucial role of leadership in an organization is to increase employee performance and productivity. There are many positive and constructive leadership that can be adopted to stimulate positive employee behavior, such as innovative work behavior<sup>[14,15]</sup>, creativity<sup>[16,17]</sup>, and organizational citizenship behavior<sup>[18]</sup>. Recognizing the crucial role of transformational leadership in knowledge sharing, understanding this type of leadership would enable researchers and practitioners to make informed judgments in exploring significant determinants that foster and enhance transformational leadership, ultimately promoting knowledge sharing. Furthermore, managers can emulate the findings of this study to create intervention and mitigative strategies that promote the best practices of transformational leadership in the workplace, thereby advocating for knowledge-sharing behavior among employees.

Second, there are significant gaps in the literature, and no extensive review of transformational leadership and knowledge sharing exists. Several studies have chartered the linkage between the two domains, but there are no direct studies on the subject, and much remains to be explored. Pellegrini et al.<sup>[19]</sup> performed a bibliometric analysis and systematic literature review on the knowledge management-leadership relationship. Four themes were identified: systematic and performance, human and relational, cultural and learning, and contextual and contingent. Alessa<sup>[20]</sup> reviewed transformational leadership's positive impact on employees in the Saudi Arabian context and found that knowledge sharing was one of the positive outcomes of the

transformational leadership style. Thomas and Gupta<sup>[21]</sup> presented a bibliometric and systematic review of tacit knowledge management in organizations, discovering that transformational leadership is one of the enablers of employees' tacit knowledge sharing. Despite that, to the best of the authors' knowledge, there have been no specific and in-depth studies that explore the role of transformational leadership on knowledge-sharing behavior. Furthermore, the need to explore past, current, and future trends in this topic is made possible through the use of a science mapping approach, incorporating bibliometric analysis. This study fills in the gap by unearthing the knowledge structure of this specific subject by presenting these objectives:

- (i) To evaluate the current research streams on transformational leadership and knowledge sharing based on bibliographic coupling analysis.
- (ii) To forecast and determine the future trends in transformational leadership on knowledge sharing based on the co-occurrence of keyword analysis.

In presenting the structure of this paper, the flow of the paper is presented. This section presents an overview and outline of the topic, elaborating on the current phenomenon, the motivation for the study, and its objectives based on the two bibliometric analyses. Section 2 outlines and explains the methodology of bibliometric analysis and the research design. Section 3 presents the findings and elaborates on the discussion of the clusters. Next, section 4 discusses the theoretical and managerial implications. Next, the limitations and future research avenues are presented in sections 5 and 6, respectively. The conclusion is finalized in section 7.

## **2. Methodology**

### **2.1. Bibliometric approach**

This approach is a quantitative method that evaluates bibliographic databases using a science mapping approach<sup>[22]</sup>. It has emerged as a popular technique exploring and analyzing literature, particularly in the fields of business and management<sup>[23]</sup>. The bibliometric approach is not a substitute for the well-established systematic review and meta-analysis approach, but rather complements the limitations of the other two methods<sup>[22]</sup>. Bibliometric analysis employs a macro-level approach, revealing the dynamics and structure of a field<sup>[24,25]</sup>. In achieving the objectives of the study, this study utilizes two of the most helpful techniques in bibliometric analysis: bibliographic coupling and co-word analysis. Bibliographic coupling maps the current and emerging trends of a topic based on two documents that are connected through the citation of a third publication. It assumes that when two publications are connected based on the citing documents, it reflects their recent connection. Meanwhile, the co-word analysis examines the co-occurrence of keywords that emerge from the documents to predict prospective trends of a topic. High-frequency keywords show their significance in the topic, and they form a thematic relationship among one another. The words can reflect future trends through notable words appearing in the network analysis<sup>[21]</sup>.

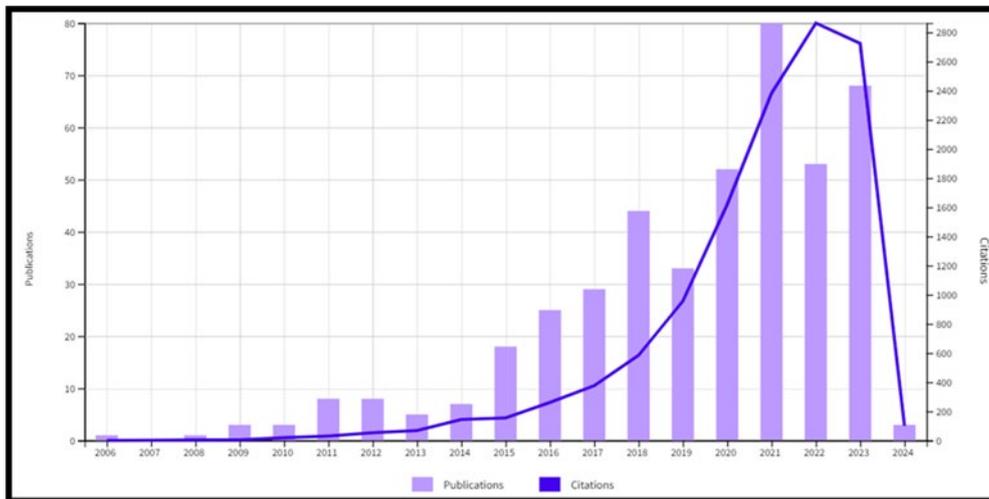
### **2.2. Data sourcing, screening, and analysis**

The authors use the following search string (**Table 1**) to identify publications based on relevant keywords. The keywords were determined prior to the collection procedure and are associated with knowledge sharing and transformational leaders, as well as their associated terminologies. The string was applied in the Web of Science (WoS) core collection to retrieve articles based on topic search (TS). The search would include articles that detect these keywords within the title, abstract, and authors' keywords only. The reason for leaving out keywords that appear in the full text is that words that appear only in the full text are not significant to the theme and scope of the article. WoS is recognized as the most reliable database, and Scopus is another bibliographic database that has been used in bibliometric analysis publications. Both are considered reliable

sources of bibliographic data for research evaluation and scientific exploration<sup>[26]</sup>. Despite several guidelines for combining the two databases in bibliometric analysis<sup>[27]</sup>, the process is tedious and prone to human error<sup>[22]</sup>.

We only limit the list of publications to journals, removing other types of publications. The reason is that journal publication ensures the quality of the dataset, as it has undergone a rigorous peer review process, unlike other publication types. Similar publications have applied only journal publications in their bibliometric analysis<sup>[28-30]</sup>. The VOSviewer version 1.6.18 software was used as a science mapping tool in this analysis to visualize the network map of the topic. It provides a substantial visualization of the map, and it is able to import and analyze data from various sources<sup>[31]</sup>.

The search for related publications was performed on 26 January 2024. Initially, the number of documents was 477. After the database was limited to journal publications only, it was finalized with 441. The total citations received were 12,350 and 10,972 (without self-citation). The average citation per document was 28, with an H-index of 59. The number of publications and citations received (**Figure 1**) on the topic shows an increasing trend of studies since the early 2010s. Owing to the significant role of transformational leadership and its effect on knowledge sharing as a productive behavior in the organization, the number of studies is predicted to increase in the coming years.



**Figure 1.** Number of publications and citations on transformational leadership and knowledge sharing.

**Table 1.** Search string related to knowledge sharing and transformational leadership.

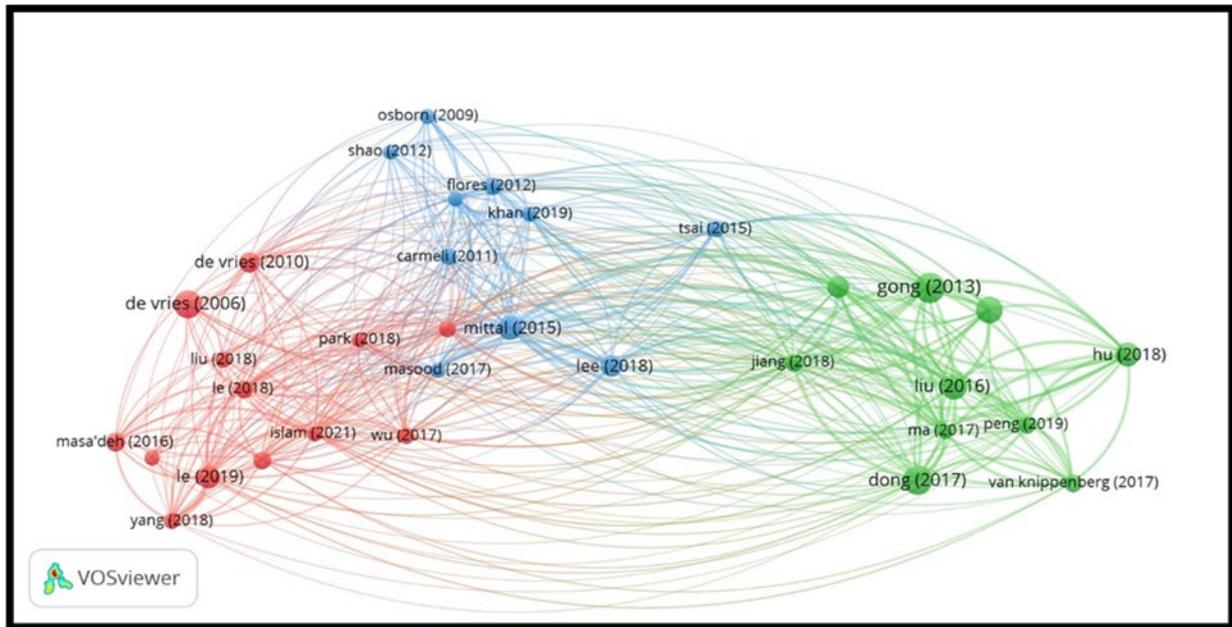
No	Keywords	Justification
1	"knowledge sharing" OR "knowledge transfer*" OR "knowledge disseminat*" OR "knowledge exchange*" OR "knowledge disseminat*" OR "knowledge acquisition*" OR "knowledge distribution*" OR "information sharing" OR "information distribution" OR "information acquisition*" OR "information exchange*" OR "information transfer*"	To identify literature related to knowledge sharing and related terminologies
2	"transformation* leader" OR "transformation* leaders" OR "transformation* leadership"	To identify literature related to transformational leaders and leadership

### 3. Findings and discussions

#### 3.1. Bibliographic coupling

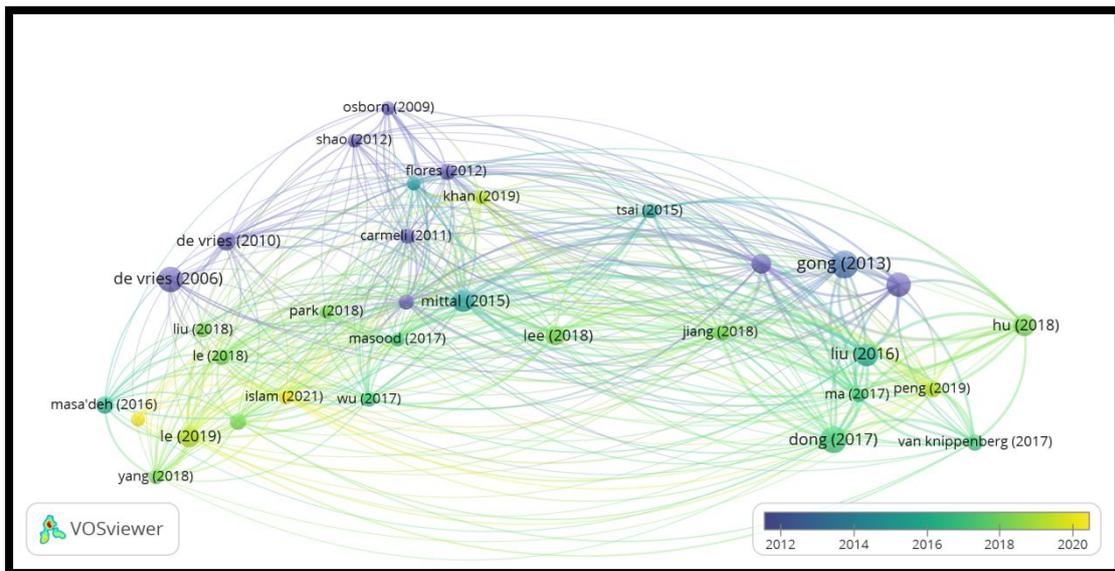
Out of the 441 documents, 33 met a significant citation threshold of 88. These 33 documents produced three imminent clusters on transformational leadership and knowledge sharing. The threshold was determined

through several trials on the citations until a robust and appropriate network map was produced. The threshold must be carefully set to make sure that it is not too high, risking over-filtering and leading to missing crucial clusters in the network. At the same time, it should not be too low, as this would cause underfiltering and lead to redundancy of clusters in the network<sup>[24,32]</sup>. **Figure 2** illustrates the network visualization map. As the figure suggests, there are three distinct clusters in the network, corresponding to three separate clusters. Each cluster is discussed based on current trends and future developments in transformational leadership and knowledge sharing. The clusters are given appropriate labels according to the authors' inductive interpretation by revisiting representative articles in the clusters and synthesizing based on research streams and themes presented.



**Figure 2.** Bibliographic coupling network on transformational leadership and knowledge sharing.

**Figure 3** shows the overlay visualization of bibliographic coupling analysis, corresponding to the network visualization in **Figure 2**. The map includes 441 articles published between 2006 and 2024. The colors indicate the publication year, with brighter yellow representing more recent studies. The visualization shows that the most recent publications are concentrated in cluster 1 (red) and cluster 2 (green), whereas cluster 3 (blue) mainly consists of older publications.



**Figure 3.** Overlay visualization of bibliographic coupling analysis.

- First Cluster 1 (red): With 13 documents, cluster 1 is labeled “leadership influence on employees’ creativity”. Employees' creativity in the organization can be enhanced or diminished through leadership. As a fundamental analysis of the topic, this cluster suggests the relevance of leadership, particularly transformational leadership, as a constructive form to stimulate employees' creativity. It was discovered that transformational leadership impacts leaders’ team creativity and performance by enacting integration and collective processes<sup>[33]</sup>. Peng et al.<sup>[34]</sup> found that self-serving leadership, as counterproductive to transformational leadership, had caused team knowledge hiding and reduced psychological safety, ultimately affecting team creativity. Dong et al.<sup>[35]</sup> discovered that individual-focused transformational leadership, also known as individual consideration, significantly impacts team creativity, leading toward knowledge sharing.
- Cluster 2 (green): This cluster comprises ten documents labeled "Social capital and knowledge sharing behavior". The social capital theory has become one of the theories that explains the organization and individual performance. The theory postulates that individuals' relationship network has a crucial influence on their interpersonal knowledge-sharing behavior<sup>[36]</sup>. Swanson et al.<sup>[37]</sup> depicted that leader competencies are essential to promoting employee knowledge sharing and job performance based on the internal ties between leaders and followers. Liu<sup>[38]</sup> asserted that organizational learning is the critical mechanism that links the relationship between knowledge transfer and social capital. Wu and Lee<sup>[39]</sup> discovered that empowering leadership directly influence on subordinates' knowledge sharing, while the psychological capital mediates the relationship.
- Cluster 3 (blue): With ten documents, this cluster is labeled as "Innovation capability through transformational leadership”. Transformational leadership has proven to influence knowledge-sharing and innovation capability among followers<sup>[13]</sup>. Chang et al<sup>[40]</sup> discovered that transformational leadership is strengthened by knowledge acquisition capability in process innovation in Chinese organizations. Khan and Khan<sup>[41]</sup> discovered that transformational leadership directly influence on employees' innovativeness through knowledge sharing and organizational learning. It was also found that social media had a significant moderating impact on knowledge sharing and innovation. Within the medical context, Masood and Afsar<sup>[42]</sup> discovered that transformational leadership positively influences psychological empowerment among nurses, leading to higher intrinsic motivation and

knowledge-sharing behavior. **Table 2** presents a summary of each cluster by presenting representative publications in each cluster.

**Table 2.** Bibliographic coupling analysis on transformational leadership and knowledge sharing.

Cluster No and color	Cluster label	Number of publications	Representative publication
1 (red)	Leadership influence on employees' creativity	13	Jiang & Chen <sup>[32]</sup> , Peng et al <sup>[33]</sup> , Dong et al <sup>[34]</sup> .
2 (green)	Social capital and knowledge sharing behavior	10	Wu and Lee <sup>[38]</sup> , Liu <sup>[37]</sup> , Swanson et al 2020 <sup>[36]</sup> .
3 (blue)	Innovation capability through transformational leadership	10	Chang et al <sup>[39]</sup> , Khan and Khan <sup>[40]</sup> , Masood and Afsar <sup>[41]</sup> .

### 3.2. Co-word analysis

The authors evaluated the co-word analysis using the same database and determined that 46 out of 1,776 keywords met 19 thresholds. As with bibliographic coupling analysis, the threshold was finalized through different threshold levels until the most suitable network map was produced. **Table 3** shows the top 15 keywords used in the co-word analysis. The highest co-occurred keywords produced are "transformational leadership" (405 occurrences), "performance" (216 occurrences), and "knowledge sharing" (173 occurrences). These words were analyzed and synthesized to identify prominent and co-occurring themes in the subject by linking these words.

**Table 3.** Top 15 keywords in transformational leadership and knowledge sharing.

Rank	Keyword	Occurrences	Total link strength
1	Transformational leadership	405	2005
2	Performance	216	1167
3	Knowledge sharing	173	1031
4	Management	122	688
5	Innovation	99	611
6	Mediating role	97	577
7	Impact	82	489
8	Behavior	74	435
9	Employee creativity	69	415
10	Creativity	62	356
11	Moderating role	59	353
12	Work	58	323
13	Trust	55	312
14	Model	55	305
15	Transactional leadership	51	306

**Figure 4** depicts the map of the co-word network structure. The network structure visibly shows three clusters representing three themes within the literature of transformational leadership and knowledge sharing. Following the author's inductive interpretation, the three clusters are assigned the appropriate labels.



leadership was found to positively influence trust in leadership and affective commitment<sup>[49]</sup>. Khattak et al.<sup>[50]</sup> discovered that trust in leaders partially mediates the relationship between transformational leadership and continuous improvement. These studies proved that transformational leadership develops a subordinate sense of security and self-belief in the organization to absorb the wisdom, direction, vision, and instruction of leaders.

A summary of the co-word analysis is presented in **Table 4** with the relevant representative keywords. The clusters suggest that future trends on this topic indicate that through transformational leadership, followers' value can be enhanced, as depicted in the clusters on empowerment (cluster 1), innovation and creativity (cluster 2), trust, absorptive capacity, and self-efficacy (cluster 3).

**Table 4.** Summary of co-word analysis on transformational leadership and knowledge sharing.

Cluster No and color	Cluster label	Number of keywords	Representative Keywords
1 (red)	Holistic empowerment through transformational leadership and its Impact on Firm Performance	17	Firm performance, impact, psychological empowerment, empowering leadership, member exchange, commitment
2 (green)	Fostering Innovation and Creativity through Psychological Safety in Organizational Work Climate	17	Performance, creativity, innovation, climate, organizations, psychological safety, work
3 (blue)	Fostering trust, absorptive capacity, and self-efficacy through transformational leadership	12	Transformational leadership, knowledge sharing, management, trust, absorptive capacity, organizational culture, self-efficacy, determinants

### 3.3. Word Cloud and trend topic

We then assess the word cloud and trend topic in the transformational leadership and knowledge sharing. **Figure 5** depicts the word cloud produced from the 50 most frequent keywords. The top ten keywords with the highest frequency are transformational leadership (n = 319). Performance (n=209), management (n=119). Although transformational leadership had the highest frequency, it was excluded from the word cloud to avoid distorting the overall pattern due to its disproportionately large size. The trending topics since 2014 are shown in **Figure 6**. The larger the circle, the more frequent the topic appears in the literature. “Transformational leadership” is the largest, indicating its significance from 2018 to 2022, followed by “performance”. Other relevant topics include “mediating role”, “innovation”, “management”, and “trust”. The most recent topics are “resources”, “capabilities”, and “moderated mediated model”. These emerging themes show a significant growth in the strategic role of intangible assets in driving organizational outcomes. It also indicates a shift in research focus toward complex models that capture the interaction between multiple variables.



Figure 5. Word cloud on transformational leadership and knowledge sharing.

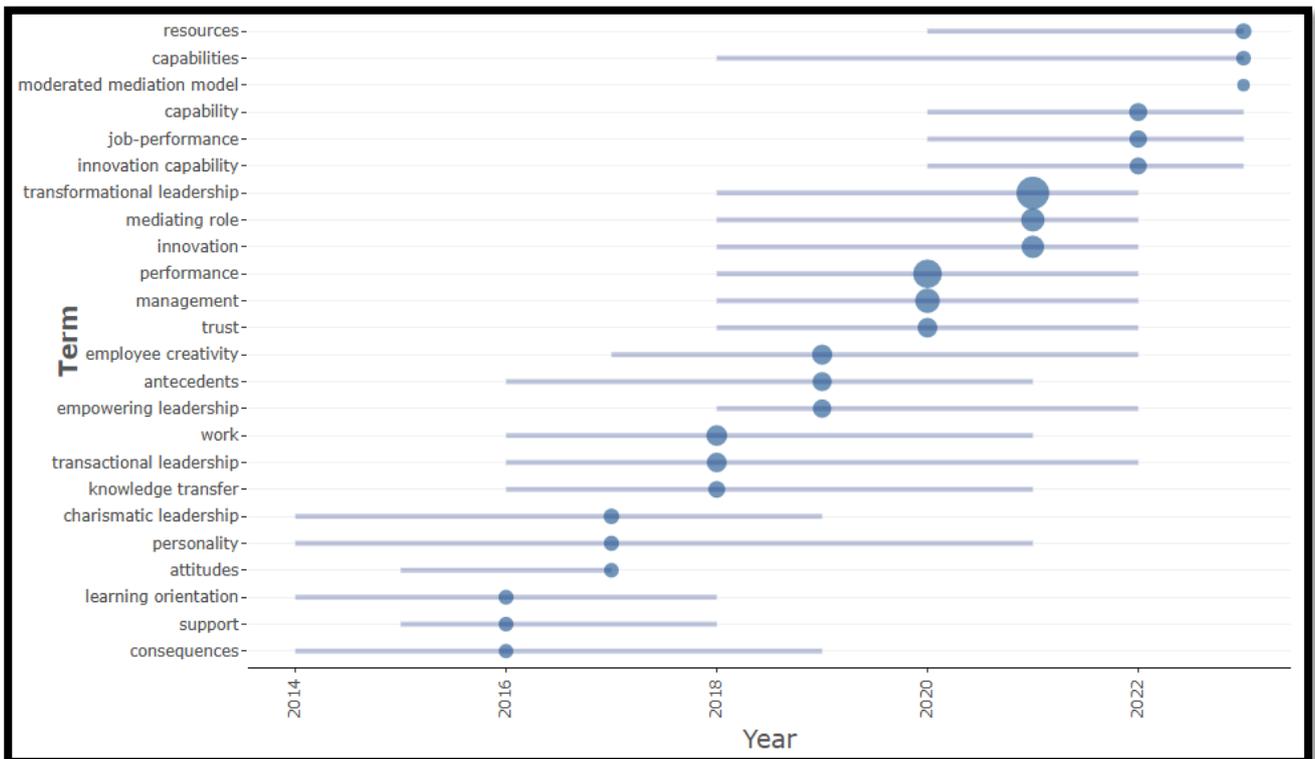
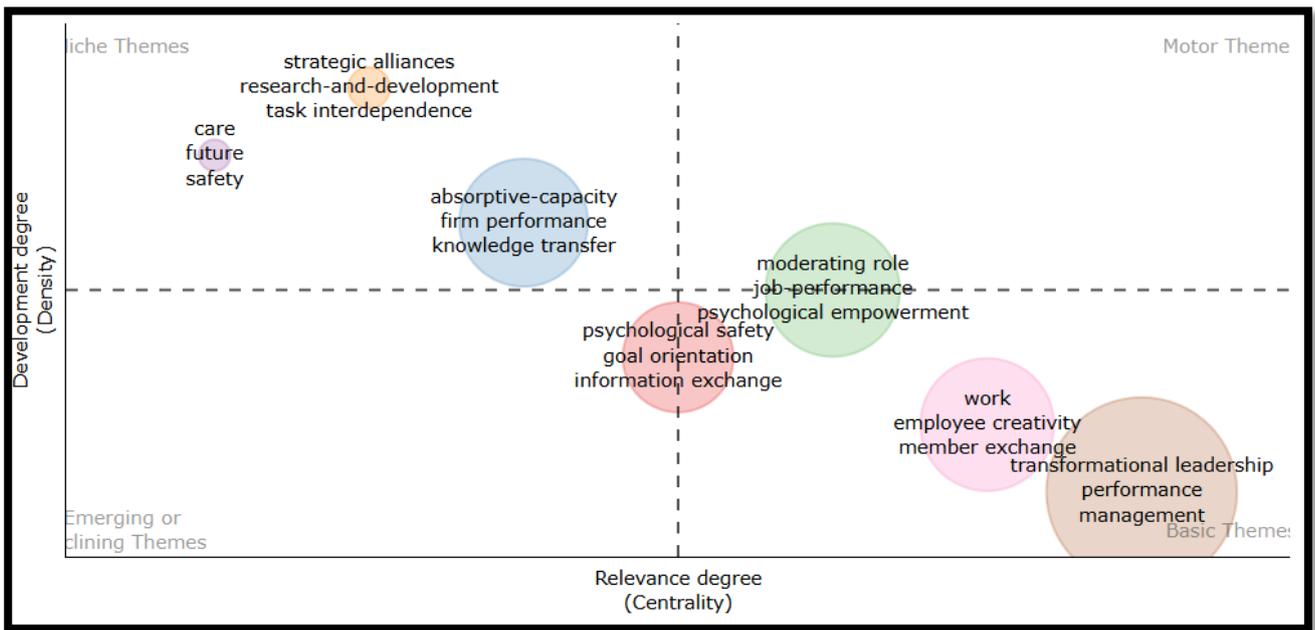


Figure 6. Trend topic map.

### 3.4. Thematic map

Using Bibliometrix through Biblioshiny software, we perform a thematic map and thematic evolution analysis. **Figure 7** depicts the thematic map of green transformational leadership and knowledge sharing. The thematic map is divided into four quadrants, each representing distinct themes and centrality measures. The motor theme in the upper right quadrant represents significant centrality and density, indicating its status as a crucial and emerging subject. The niche theme in the upper left quadrant represents low centrality and high density, indicating themes that are highly development and distinct. The lower left quadrant, representing the emerging or declining theme, is characterized by low density and centrality, indicating a well-developed but declining trend. While the lower right quadrant indicates a basic theme with high centrality and well-developed.

The thematic map shows multiple interrelations among these various themes, particularly in the niche and basic themes. In the niche theme, the most significant interrelations are between absorptive capacity, firm performance, and knowledge transfer. These connections highlight how a firm’s ability to absorb and apply external knowledge directly influences its competitive advantage. Moreover, the integration of these themes suggests potential pathways for future research on innovation and organizational learning. In the basic themes, the most significant is the interrelation between transformational leadership, performance, and management. A theme connecting work, employee creativity, and member exchange is also evident in the map. Together, these interrelations illustrate the dynamic interplay between leadership approaches, organizational capabilities, and employee outcomes within the broader knowledge management landscape.



**Figure 7.** Thematic map of green transformational leadership and knowledge sharing.

### 3.5. Thematic evolution

In thematic evolution analysis, the dataset was divided into three time slices to assess the development of the subject over each time period. The cutting years are determined equally within a 4-year period for each slice, based on four key points: 2010, 2015, 2020, and 2024. Four thematic maps for the period 2006-2010, 2011-2015, 2016-2020, and 2021-2024 are shown in **Figure 8**. In the 2006-2010 phase, transformational leadership was the only significant theme. In the next phase (2011-2015), it has evolved into 8 themes (member exchange, consequence, absorptive capacity, perceptions, intrinsic motivation, performance, transformational leadership, and charismatic leadership). It then developed into 20 themes (2016-2020), with transformational leadership as the most significant. In the most recent phase (2021-2024), 21 themes emerged, with transformational leadership again being the most significant.

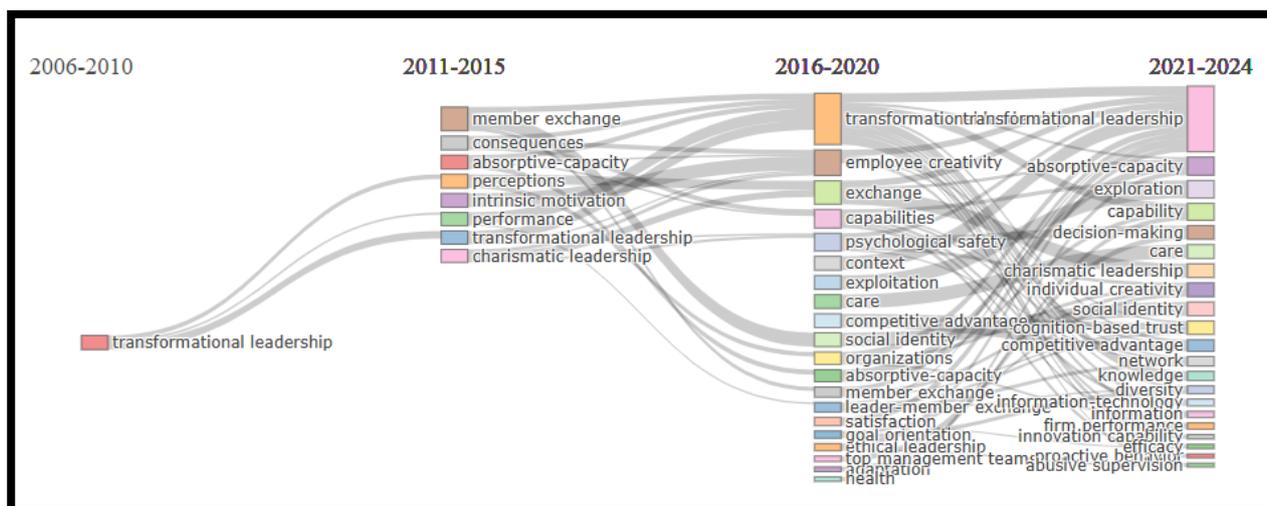


Figure 8. Thematic evolution over four periods from 2006-2024.

## 4. Implications

### 4.1. Theoretical implications

There are several theoretical implications stemming from this study. Findings suggest that leaders' support enhances employees' learning and knowledge outcomes. Identifying different predictors of transformational leadership enables professionals and scholars to pay more attention to organizational learning through knowledge sharing that can promote overall personnel effectiveness and, eventually, organizational performance<sup>[9]</sup>. Transformational leadership has been shown to foster creativity among employees (cluster 1, bibliographic coupling) and creativity (cluster 2, co-word analysis). Employees must develop creativity and innovativeness to achieve organizational performance<sup>[51,52]</sup>. Among the crucial predictors of transformational leadership are psychological empowerment in co-word analysis (cluster 1), psychological safety in co-word analysis (cluster 2), and the construction of social capital as a driver for knowledge sharing behavior among employees in bibliographic coupling analysis (cluster 3). These predictors show that transformational leadership inculcates positivity among employees in the organization to become better people compared to employees with transactional leadership styles.

Creativity and innovation can be developed through a conducive work environment, enabling subordinates to grow and develop. The extant literature has shown that with transformative leadership, employees' innovativeness can be enhanced<sup>[53-55]</sup>. These leaders take initiatives far beyond the regular leadership style by imparting motivation toward employees' self-interest to pursue the collective vision. Similarly, transformative leaders lead to improvement and enhance employees' creativity through creative performance. This leadership style has been associated with employee satisfaction and productivity<sup>[56]</sup>. Leadership has also been shown to improve team creativity<sup>[57]</sup>. Team creativity is crucial to determining organizational growth and survival in today's challenging digital environment.

### 4.2. Managerial implications

This study had several managerial implications. First is the role of leaders to become transformative and change to become a transformational leader through organizational change management. Some are born to be leaders, while some are, in certain circumstances, forced to be leaders. Hence, not all leaders possess a specific transformational leadership style. One of the effective ways that transformational leaders do this is by knowing individual personalities among subordinates based on the big-five personality traits (extraversion,

conscientiousness, agreeableness, openness, and neuroticism) that will cover the individual consideration within the transformational leadership trait<sup>[58]</sup>. Human resource professionals should identify the personality traits to design specific intervention and mitigation programs to infuse elements of transformational style among organizational leaders. Transformational leaders should be created by design through a well-planned program and initiatives at the top management level. In the same vein, the top management should develop their transformative leadership trait by learning and doing according to best practices from real-transformational born leaders.

Leaders would want their subordinates to be innovative in accomplishing tasks and duties. Innovative solutions are crucial as an organization's competitiveness depends on its ability to keep pace with economic, technological, and societal transformation. To stimulate employees' innovativeness, leaders need to amplify employees' intellectual stimulation. Depending on the organization, an employee's intellectual stimulation can be amplified. It was shown that intellectual stimulation can increase innovativeness among employees differently<sup>[59]</sup>. Apart from that, the value of individualized consideration by the leaders imparted to followers would invigorate followers to accept a particular leader strengthened by intellectual stimulation and inspirational motivation. Leaders should be attentive to employees' ideas by allowing them to suggest strategies to realize innovative solutions<sup>[60,61]</sup>. This would lead to followers becoming confident in achieving goals and improving their suggestions toward innovative solutions. This study implies that human resource professionals should infuse and incorporate knowledge and practical experience in transformational leadership through leadership development and training. Such training can be performed through conventional seminars and sharing sessions on best practices or through a more specific and prolonged approach through coaching and mentoring.

## **5. Limitations**

This study possesses several limitations that can be further improved. Firstly, this study only adopts the WoS database. Other themes might be produced if different databases like Scopus and PubMed were used. Despite that, WoS is known for its quality database, producing more quality publications than other databases. Secondly, since science mapping from the bibliometric analysis depends on qualitative interpretation, this study risks the authors' subjective evaluation. This inductive approach might produce slightly different outcomes if interpreted by other authors, particularly in determining the threshold of citations in the bibliographic coupling and co-word analysis and the clusters' labeling. Despite that, the qualitative research paradigm depends on the authors as the tool for evaluating subjective interpretation that justifies the citation threshold and clusters' labels.

## **6. Future research avenues**

Future studies could examine how different leadership styles promote knowledge sharing within an organization. For instance, Lee et al.<sup>[62]</sup> have provided a meta-analysis review on the differences of 13 leadership styles on employees' creative and innovative performance. Creative performance among employees was predicted strongly by entrepreneurial, inclusive, empowering, and authentic leadership. In contrast, transactional leadership and supportive leadership predict innovative performance. Entrepreneurial leadership, for instance, was found to influence employees' innovative work behavior and, ultimately, knowledge-sharing behavior<sup>[63]</sup>. Similarly, inclusive leadership was found to predict innovativeness, with the mediating role of psychological safety<sup>[64]</sup>. Future studies could also look into destructive and counterproductive leadership behavior, such as exploitative leadership<sup>[65,66]</sup>, authoritarian leadership<sup>[67]</sup>, and abusive leadership<sup>[68,69]</sup>. These counterproductive leadership strategies can also be studied concerning the impact of knowledge hiding on

employees. These leadership style differs from the productive leadership that acts as mentors and instructors to help their subordinates grow and achieve their goals in learning, innovating and developing personal value.

## **7. Conclusion**

This study has provided a crucial understanding of employees' knowledge sharing from the influence of transformational leadership. The current and future streams of the subject are discovered, and intervention strategies are explored to enhance its development further. The main themes in the bibliographic coupling suggested that transformational leadership influences creativity and innovation. It also brought up the crucial role of social capital in behavior. In the co-word analysis, themes are related to mitigation and intervention strategies. These include fostering employee creativity and innovation, trust, self-efficacy, and absorptive capacity through transformational leadership. Organizations must develop strategies to promote transformational leadership by providing incentives and rewards to managers who demonstrate effective leadership styles. The metric includes the number of employees who can produce innovative and creative work ideas and the productivity of subordinates through accomplished tasks provided by the organization. The idea of transformational leadership corresponds to the market's needs, which requires leaders to be proactive in tandem with the global competitive digital landscape.

## **Author contributions**

Conceptualization, Mohd Najmuddin Hasan and Muhammad Ashraf Fauzi; methodology, Muhammad Ashraf Fauzi and Christine Tan Nya-Ling; software, Walton Wider; validation, Walton Wider and Chong Chin Wei; formal analysis, Muhammad Ashraf Fauzi; investigation, Muhammad Ashraf Fauzi and Chong Chin Wei resources, Christine Tan Nya-Ling; data curation, Mohd Najmuddin Hasan; writing—original draft preparation, Muhammad Ashraf Fauzi and Mohd Najmuddin Hassan; writing—review and editing, Walton Wider and Chong Chin Wei; visualization, Mohd Najmuddin Hassan; supervision, Muhammad Ashraf Fauzi; project administration, Christine Tan Nya-Ling; funding acquisition, Muhammad Ashraf Fauzi. All authors have read and agreed to the published version of the manuscript.

## **Conflict of interest**

The authors declare no conflict of interest.

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