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RESEARCH TRENDS BETWEEN THE RELATIONSHIP BETWEEN LEARNING IN THE WORKPLACE AND KNOWLEDGE MANAGEMENT

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Abstract

The research addresses the intersection between workplace learning and knowledge management, emphasizing the significance of comprehending how organizations influence the acquisition and application of knowledge. Despite advancements, gaps are identified, particularly in the absence of specific reference models for cooperative education and the necessity to investigate the relationship between learning in specific work environments and knowledge management strategies. The methodology is based on the PRISMA 2020 guide for systematic review in the Scopus and Web of Science database. The results indicate a consistent increase in academic output, with 2009 identified as the year of greatest interest. The author Margaryan A, the Journal of Knowledge Management, and the countries of the United States and the United Kingdom are identified as thematic references. The thematic evolution over the years spans from Training to Workspace Productivity, with the term Informal Learning becoming a dominant keyword. This bibliometric analysis offers a comprehensive overview of the relationship between learning in the workplace and knowledge management, identifying trends, key contributions, and research gaps.

Keywords: Tacit knowledge, work environment, transactional leadership, PRISM 2020, learning.

Résumé

La recherche s'intéresse à l'articulation entre l'acquisition de savoirs sur le lieu de travail et la gestion des connaissances, mettanten exergue la nécessité de saisir comment les organisationsfaçonnentl'acquisition et l'application des connaissances. Malgré les avancées notables, des lacunes sontidentifiées,

notammentl'absence de modèles de référencespécifiques pour l'enseignementcoopératif et la nécessitéd'étudier la relation entre l'apprentissage dans des environnements de travail spécifiques et les stratégies de gestion des connaissances. La méthodologieemployées'appuie sur le guide PRISMA 2020 pour l'examensystématique dans les bases de données Scopus et Web of Science. Les résultatsobtenusrévèlent une augmentation constante de la production académique, avecl'année 2009 se distinguantcomme un pointd'intérêtmajeur. L'analysemet en lumièrel'importance des travaux de Margaryan A., du JournalofKnowledge Management et des pays des États-Unis et du Royaume-Uni en tant que référencesthématiquesmajeures. L'analysethématiquemet en évidence une évolutionchronologique des sujetsabordés, avec une prépondéranceprogressive du concept d'apprentissageinformel. Cetteanalyse bibliométrique offre une vued'ensemble de la relation entre l'apprentissage sur le lieu de travail et la gestion des connaissances, en identifiant les tendances, les contributionsclés et les lacunes de la recherche.
Mots-clés: Connaissancestacites, environnement de travail, leadership transactionnel, PRISM 2020, apprentissage.

Introduction

The connection between workplace learning and knowledge management has gained interest in academic literature, underscoring the importance of understanding how the work environment affects the acquisition and application of knowledge in organizations. The provision of content and knowledge services was examined as a means of building intellectual capital in learning organizations, highlighting its relevance for the development of organizational knowledge (Radenković et al., 2014). Furthermore, the relationship between informal learning effort and attitude toward knowledge sharing in times of labor conflict was explored, offering valuable insights into the dynamics of learning in conflict situations (Baburaj & Kumar, 2022). Likewise, the role of knowledge sharing approaches in facilitating business innovation was investigated, highlighting the importance of internal knowledge sharing strategies in driving organizational innovation (Tieng et al., 2019).

The necessity of developing connectivity as an integral part of knowledge management is emphasized in Garcia (2009). The proposal of Personal Knowledge Management (PKM) offers a path specifically designed for learners in higher education and work environments, contributing significantly to the understanding of how workers in educational environments can effectively manage knowledge in their work environment (Garcia, 2009). In addition, the experiences of teachers in sharing knowledge when teaching new educational programs are examined, providing a valuable perspective on how knowledge management manifests itself in teaching. Research highlights the importance of understanding the dynamics of knowledge sharing between educators and its impact on workplace learning (Hove Langdal, 2023). The influence of social media as a collaborative medium on workplace learning was also explored, highlighting the crucial role of social media platforms in facilitating collaboration and knowledge sharing in work environments (Thomas &Akdere, 2013).

Despite the advancement of research at the intersection between workplace learning and knowledge management in recent years, significant gaps remain that require further evaluation. The need to explore the development of specific reference

models for cooperative education, based on information and communication technologies (ICT), is highlighted. This approach represents a key research area that has not yet been fully explored in the existing literature on workplace learning and knowledge management (Bouras et al., 2014). Furthermore, the paucity of studies that comprehensively address the relationship between learning in specific work environments and the effective implementation of knowledge management strategies justifies the need to conduct comprehensive bibliometrics. Therefore, the objective of this research is to examine research trends on the relationship between workplace learning and knowledge management. In light of the aforementioned considerations, the following research questions are also posed:

-What are the years in which the greatest interest has been expressed regarding the relationship between learning in the workplace and knowledge management?

-What is the nature of the growth in the number of scientific articles on the relationship between workplace learning and knowledge management?

-What are the principal research sources on the correlation between learning in the workplace and knowledge management?

-What are the overarching themes that emerge from an analysis of scientific literature on the relationship between learning in the workplace and knowledge management?

-What are the most prevalent and emerging keywords in the field of research pertaining to the relationship between workplace learning and knowledge management?

- How are the keywords in the scientific literature on the relationship between workplace learning and knowledge management classified according to their function?

-What are the principal thematic clusters pertaining to the relationship between workplace learning and knowledge management, according to their respective functions?

-What are the emerging and evolving keywords in the field of research pertaining to the relationship between workplace learning and knowledge management, with particular attention to their functional characteristics?

-What topics are identified as key drivers for the development of a research agenda on the relationship between learning in the workplace and knowledge management, according to their functional role?

This research is structured into six defined sections to guarantee a systematic and comprehensive presentation of the findings. It begins with a concise summary that provides an overview of the main objectives and results. The introduction contextualizes the topic and establishes the theoretical framework, followed by the methodology that details the approach and procedures used. The results present the findings in a clear and organized manner, followed by a discussion that interprets the results in light of the theoretical context and compares them with existing literature. Finally, the conclusions summarize key points, highlight practical implications, and suggest directions for future research.

Methodology

The relationship between learning in the workplace and knowledge management is a topic of significant interest in contemporary research. The necessity to comprehend

and optimize the manner in which organizations facilitate continuous learning in their workplaces, and the relationship between this process and effective knowledge management, has attracted the attention of academics and practitioners alike. In this context, the PRISMA 2020 statement presents as an essential and updated guide for the presentation of systematic reviews, emphasizing the importance of transparency and methodological quality in research (Page et al., 2021). Although not specifically focused on the topic, this reference highlights the need for rigor in research, a fundamental principle when addressing the intersection between workplace learning and knowledge management. The convergence of these elements is of paramount importance in order to fully and effectively address the challenges and opportunities present in this constantly evolving field.

Eligibility criteria

In the field of bibliometrics, which focuses on the relationship between learning in the work environment and knowledge management, meticulous inclusion criteria have been established. Records that meet the requirements of having a title clearly linked to the topic, as well as keywords that reflect the fundamental essence of the research, will be analyzed. Furthermore, papers that specifically address the various concepts related to the intersection between workplace learning and knowledge management will be considered, ensuring comprehensive and detailed coverage of the existing literature on this topic.

Regarding the exclusion phases, three discerning criteria have been established. In the first phase, all records that have erroneous indexing will be eliminated, thus ensuring the quality and accuracy of the database. The second phase of exclusion will apply only to systematic literature reviews, excluding those documents for which the full text is not available. It is relevant to highlight that, for this specific bibliometrics, only metadata will be analyzed. This implies that the third phase of exclusion will eliminate records with incomplete indexing, thus guaranteeing the integrity of the information to be analyzed in the context of this research.

Information sources

To carry out this bibliometric about the relationship between learning in the work environment and knowledge management, it was decided to use the Scopus and Web of Science databases, given their recognition as the main sources of scientific information today. The choice is supported by a comparative analysis of the coverage of scientific journals in both databases, which highlights the relevance and breadth of the publications indexed in both platforms (Mongeon and Paul-Hus, 2016). The completeness and quality of the information collected in Scopus and Web of Science provide a solid foundation for bibliometrics, ensuring the representativeness of scientific literature at the intersection between workplace learning and knowledge management.

Search strategy

In order to conduct a bibliometric search in the Scopus and Web of Science databases, two specialized search equations were designed. This strategy was implemented in order to ensure the completeness and accuracy of the identification of relevant studies that address the relationship between learning in the work environment and knowledge management. The formulation of search equations adapted to the predefined inclusion criteria allowed the incorporation of specific terms and key concepts related to the topic of interest. In addition, the specific characteristics and

search capabilities of each database were taken into account to ensure the effectiveness and optimal capacity for retrieving relevant information. In this regard, the following databases were considered:

For the Scopus database: (TITLE ("Workplace Learning" OR "Corporate Learning" OR "On-the-Job Training") AND TITLE ("Knowledge Management" OR "Knowledge Sharing" OR "Knowledge Transfer" OR "Knowledge Retention " OR "Knowledge Utilization" OR "Information Management")) OR (KEY ("Workplace Learning" OR "Corporate Learning" OR "On-the-Job Training") AND KEY ("Knowledge Management" OR "Knowledge Sharing" OR " Knowledge Transfer" OR "Knowledge Retention" OR "Knowledge Utilization" OR "Information Management"))

For the Web of Science database: (TI= ("Workplace Learning" OR "Corporate Learning" OR "On-the-Job Training") AND TI= ("Knowledge Management" OR "Knowledge Sharing" OR "Knowledge Transfer" OR "Knowledge Retention" OR "Knowledge Utilization" OR "Information Management")) OR (AK= ("Workplace Learning" OR "Corporate Learning" OR "On-the-Job Training") AND AK= ("Knowledge Management" OR "Knowledge Sharing" OR "Knowledge Transfer" OR "Knowledge Retention" OR "Knowledge Utilization" OR "Information Management"))

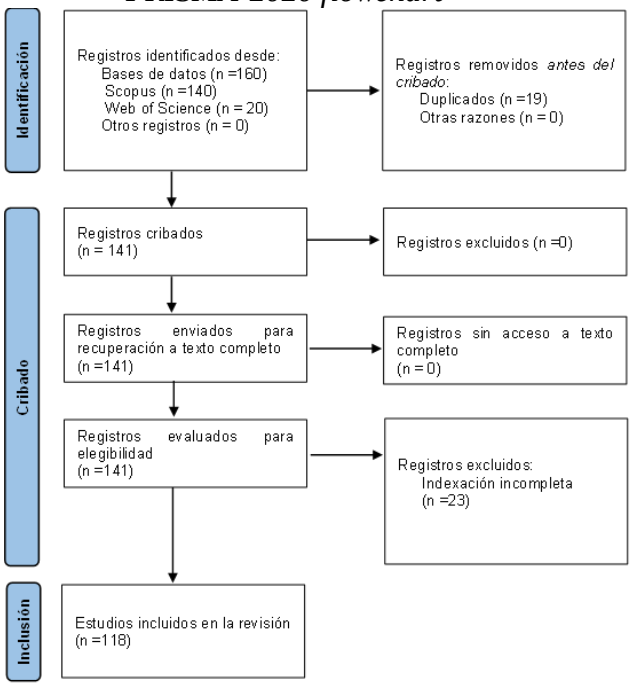
Data management

To conduct the bibliometric analysis of the relationship between learning in the work environment and knowledge management, Microsoft Excel® was employed as the principal tool for the extraction, storage, and efficient processing of the information gathered from the Scopus and Web of Databases. Science. The versatility and data manipulation capacity of Excel® enabled the systematic organization of bibliographic records, as well as the preliminary analysis and preparation of the data for subsequent processing. Furthermore, to visualize the results and generate bibliometric graphs, the free software VOSviewer® and Microsoft Excel® were employed. This methodological approach is based on the effectiveness of VOSviewer® to graphically represent bibliometric networks, as evidenced in Katoch (2022), in the bibliometric analysis of research on IoT in supply chain and logistics management. The combination of these tools provided a comprehensive and efficient approach to exploring and presenting bibliometric indicators related to the topic of study.

Selection process

In accordance with the guidelines established in the PRISMA 2020 statement (Page et al., 2021), it is of paramount importance to address transparency and methodological quality during the selection of bibliographic studies. In this context, the necessity of providing details on the use of internal automatic classifiers is emphasised, as is the implementation of internal or external validations to assess the risk of omitted studies or erroneous classifications. In the present study on the relationship between learning in the work environment and knowledge management, an automation tool in Microsoft Excel® was employed as an internal resource. This automatic classifier was developed collectively by all the study researchers, who, independently, applied the tool to apply inclusion and exclusion criteria. The objective of this strategy was to mitigate the risk of omitted studies or incorrect classifications by achieving the convergence of results and the joint creation of an automated system that contributed to coherence and reliability in the bibliographic selection process.

Figure 1
PRISMA-2020 flowchart



Alt text figure 1. Diagram representing the flow of information according to the PRISMA-2020 guidelines for systematic review and meta-analysis.

In the context of bibliometrics on learning in the workplace and knowledge management, the initial stage involved the identification of records through searches in Scopus and Web of Science, followed by the elimination of duplicates. Subsequently, three phases of exclusion were carried out, where records with incorrect indexing, those without access to the full text (only applicable to systematic reviews) and those with incomplete indexing were discarded. Consequently, 118 articles were included for bibliometric analysis, thereby ensuring the quality and relevance of the sample.

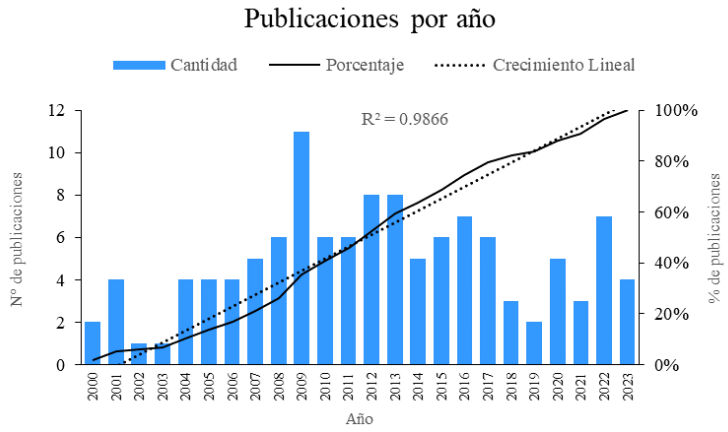
Results

The results section presents the findings obtained from the analysis of collected data in detail. These results provide a clear and objective view of the patterns identified during the study, thus allowing a deeper understanding of the relationships and trends observed in relation to the research topic. Each result is presented in an organized manner and analyzed based on its relevance to the stated objectives. This offers a solid basis for discussion and subsequent conclusions.

The bibliometric analysis of the relationship between learning in the work environment and knowledge management has revealed significant patterns in academic production over time. As illustrated in Figure 2, a linear growth of 98.66% is evident, indicating a consistent increase in the publication of articles on this topic. The years 2009, 2012, 2013, and 2022 stand out as periods of maximum scientific production, indicating a constant interest and specific moments of greatest attention in the literature. This temporal analysis offers valuable insight into the evolution and relevance of research at the convergence of workplace learning and knowledge management,

providing a solid foundation for understanding notable trends and areas of focus in this field.

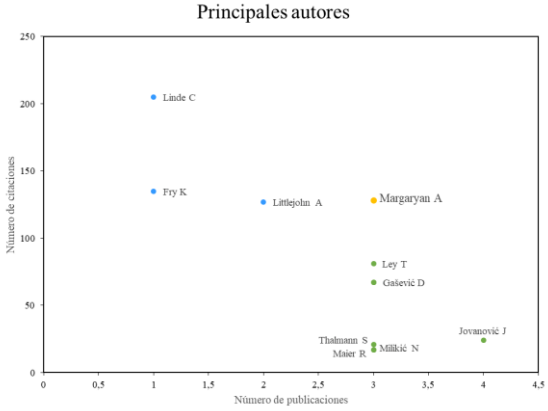
Figure 2
Publications by year



Alt text figure 2. Chart showing the number of publications per year, generated using data from Scopus and Web of Science.

The study of the relationship between learning in the work environment and knowledge management reveals the presence of three distinctive groups of authors, as shown in Figure 3. The first group, led by Margaryan A, stands out due to its notable productivity and high impact, as evidenced by significant citations. In contrast, a second group is identified as a reference in terms of impact, represented by authors such as Linde C and Littlejohn A, despite having lower scientific productivity. Finally, a third group is observed, headed mainly by Jovanovic J and Ley T, which stands out for its scientific productivity, although its impact, as measured by citations, is comparatively minor. This analysis provides a stratified perspective of the key players in the field, highlighting various strengths in productivity and impact among key authors in the convergence of workplace learning and knowledge management.

Figure 3
Main authors.

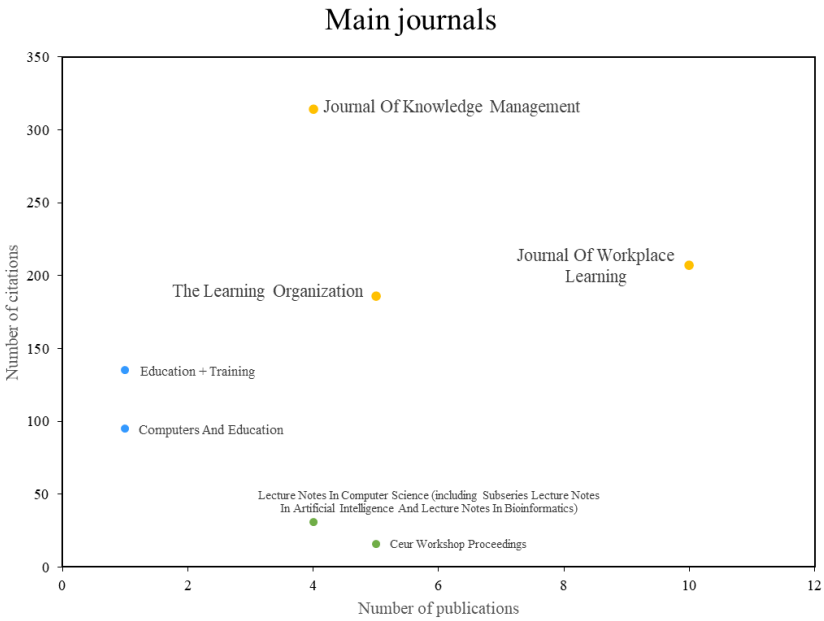


Alt text figure 3. Chart highlighting the most notable authors based on data from Scopus and Web of Science.

The bibliometrics conducted in the research on the relationship between learning in the work environment and knowledge management, as illustrated in Figure 4, focused on the analysis of the thematic evolution of the literature over the years (2000-2023) by studying the most used keywords in each year. In the early years, such as 2000, research highlighted the emergence of key concepts such as "Training." As time passed, a change in the predominant themes became evident, manifesting itself in the emergence of more contemporary and specific keywords. These include "Workspace Productivity," "Tacit Knowledge," "Work Environment," and "Transactional Leadership." These terms illustrate current trends in research, highlighting the evolution and diversification of thematic approaches at the intersection between workplace learning and knowledge management over the past two decades.

The bibliometric analysis reveals the existence of three distinct groups of scientific journals in the field of the relationship between learning in the work environment and knowledge management. Firstly, a set of journals is identified that have been highlighted for their productivity and high impact. These include the Journal of Knowledge Management, the Journal of Workplace Learning, and The Learning Organization. In contrast, a group of journals is distinguished that, although they have a significant impact, show a relatively low scientific productivity. This group includes Education + Training. A third group of journals is observed whose prominence is based mainly on their high scientific productivity, rather than on the number of citations received. One notable example is Ceur Workshop Proceedings, which is one of the most prominent in this sense. This analysis provides a comprehensive view of the distribution of the main journals in the field, considering both their productivity and their impact on the scientific community.

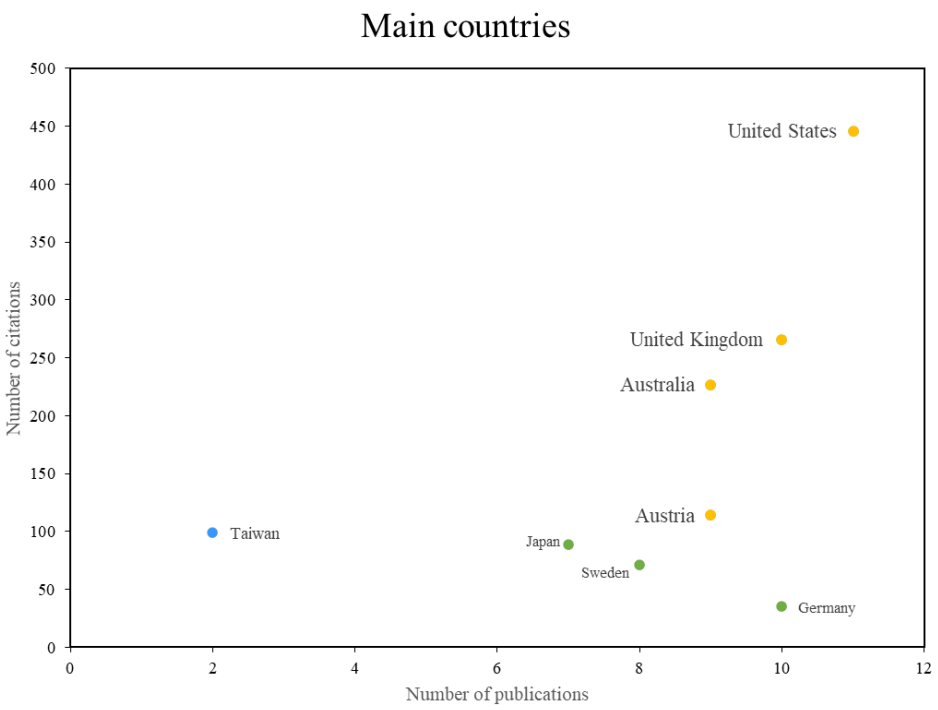
Figure 4
Main journals



Alt text figure 4. Chart showing the most relevant journals according to data from Scopus and Web of Science.

The analysis of the major countries reveals the existence of three distinct groups in the field of the relationship between learning in the workplace and knowledge management. Firstly, a group of countries is identified that are notable for their productivity and high impact. These include the United States, the United Kingdom, Australia, and Austria. Another group of countries is distinguished that, although they have a significant impact, show relatively low scientific productivity. This group includes Taiwan. Finally, a third group of countries is observed whose prominence is based mainly on their high scientific productivity, rather than on the number of citations received. Germany is one of the most prominent countries in this sense. This provides a comprehensive view of the distribution of the main countries in the field, considering both their productivity and their impact on the scientific community.

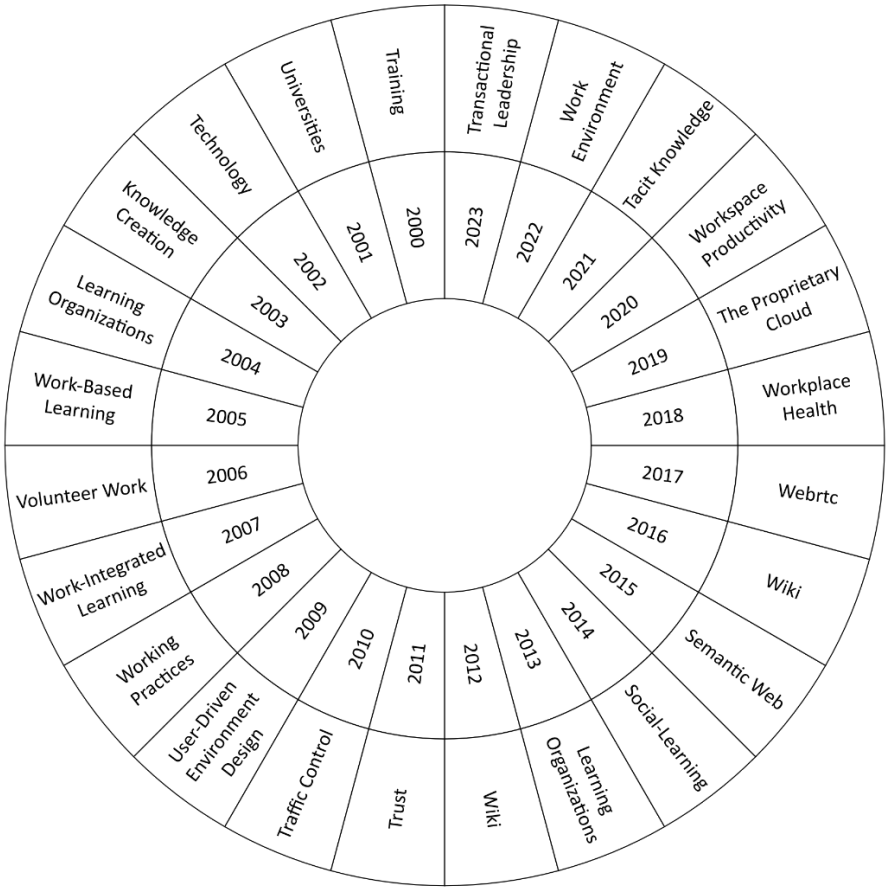
Figure 5
Main countries



Alt text figure 5. Chart presenting the most outstanding countries in terms of contributions, based on data from Scopus and Web of Science.

The present study, as shown in Figure 6, focused on the analysis of the thematic evolution of the literature over the years (2000-2023) by studying the most used keywords in each year. In early years, such as 2000, research highlighted the emergence of key concepts such as "Training." As time passed, a change in the predominant themes became evident, manifesting itself in the emergence of more contemporary and specific keywords. These include "Workspace Productivity," "Tacit Knowledge," "Work Environment," and "Transactional Leadership." These terms illustrate current trends in research, highlighting the evolution and diversification of thematic approaches at the intersection between workplace learning and knowledge management over the past two decades.

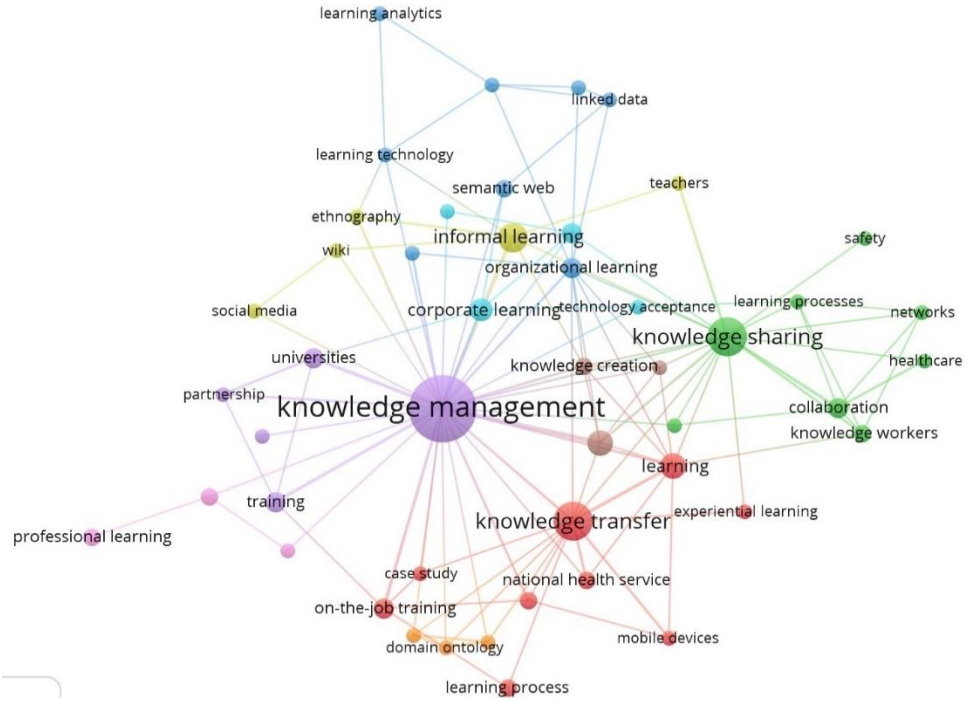
Figure 6
Thematic evolution.



Alt text figure 6. Visual representation of the evolution of topics or research areas over time, using data from Scopus and Web of Science.

An analysis of the co-occurrence network of keywords in the field of learning in the work environment and knowledge management is presented, which reveals a total of nine thematic clusters (Figure 7). Of these, the purple cluster is particularly noteworthy, as it is characterized by terms such as knowledge management, universities, partnership, and training. This cluster demonstrates a close relationship between knowledge management, inter-institutional collaboration, and training practices. The red cluster, which includes terms such as "knowledge transfer," "National Health Service," "case study," and "learning," suggests a focus on the transfer of knowledge in specific contexts. In addition, other clusters of green, yellow, orange, blue, and purple, each representing different elements of conceptual affinity, enrich the understanding of the relationship between learning at work and knowledge management.

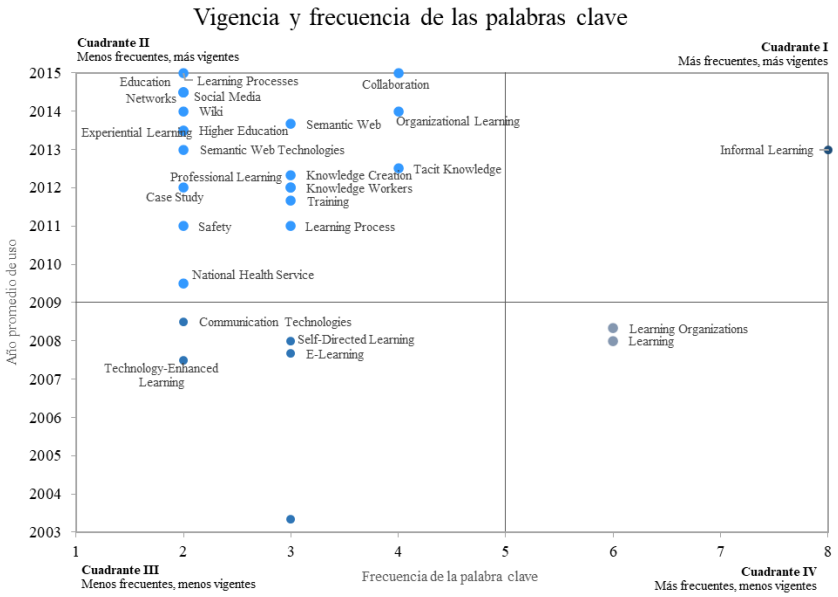
Figure 7
Keyword co-occurrence network.



Alt text figure 7. Diagram showing a network of keywords that frequently co-occur in publications, created with data from Scopus and Web of Science.

The current research presents an innovative perspective by introducing a Cartesian plane to analyze the relationship between workplace learning and knowledge management, as illustrated in Figure 5. This plane is characterized by measuring the frequency of word use on the X axis and the validity of use on the Y axis, which allows the identification of four different quadrants. Quadrant 4 contains concepts that have decreased in relevance over time, such as "Learning Organizations" and "Learning." Conversely, quadrant 2 displays infrequent but highly current keywords that are considered emerging, including "social media," "learning processes," "semantic web," and "education networks." Meanwhile, in quadrant 1 there are consolidated and growing concepts, such as "informal learning," which suggests persistence and increase in the relevance of these topics over time. This Cartesian approach provides a valuable tool for understanding the dynamics of change and stability in the workplace learning and knowledge management literature.

Figure 8
Frequency and validity of keywords



Alt text figure 8. Chart illustrating the frequency and relevance of keywords in research, using data from Scopus and Web of Science.

Discussion

This analysis section plays a pivotal role in meticulously examining the results obtained in research on the relationship between workplace learning and knowledge management. Here, the bibliometric findings are delved into, highlighting patterns, trends, and relationships identified throughout the study. In addition to the comprehensive evaluation of the results, space is dedicated to the exploration of the practical implications derived from the research, offering valuable perspectives for its application in the work and organizational environment. This section also addresses the methodological limitations of the study, providing a critical evaluation of the restrictions and challenges encountered while conducting bibliometrics. The aim of this section is to enrich the reader's understanding of the importance and possible practical applications of the relationship between workplace learning and knowledge management, while recognizing and contextualizing the inherent limitations to the methodology used.

A quantitative and qualitative analysis of the growth of scientific literature on the relationship between workplace learning and knowledge management.

During key years of scientific production related to the intersection between workplace learning and knowledge management, such as 2009, 2012, 2013 and 2022, a diversity of thematic and methodological approaches is observed. The development of connectivity in the higher education field is addressed, proposing a path for personalized knowledge in the work environment. The importance of connectivity is underscored as a crucial element for effective learning in the workplace (García, 2009).

Conversely, a question-and-answer system designed to assess the willingness of employees to assist their colleagues in various work scenarios was investigated. In 2009, the study highlighted the fundamental role of access to and management of knowledge in learning in the workplace. It emphasized the importance of accessibility to knowledge and how its proper management can influence organizational learning processes. This approach underscored the need for effective strategies to facilitate access to relevant knowledge within organizations, which in turn could improve the effectiveness of learning in the work environment.

In 2012, the factors that affect the acceptance of e-learning in organizational learning environments were examined. The research highlighted the importance of creating a learning environment in which employees feel motivated and comfortable with e-learning technologies. This highlights the need for organizations to promote a culture that encourages the adoption and effective use of e-learning tools, which could improve the effectiveness of workplace learning in the digital era (Cheng et al., 2012).

In 2013, a study was conducted on knowledge transfer and the role of local absorptive capacity in science and technology parks. The research highlighted the importance of the capacity of local organizations to absorb and apply external knowledge, especially in highly specialized environments such as The study highlighted the need to develop internal capabilities that facilitate the effective transfer of knowledge, which could boost innovation and development in the work environment (Hair Awang, Yusof Hussain & Abdul Malek, 2013).

In 2022, the impact of empowering leadership on employee creativity was investigated, with work engagement and knowledge sharing serving as mediators. The study highlighted how leadership that empowers employees can foster greater engagement and knowledge sharing among team members, which in turn could stimulate creativity and innovation in the work environment. This reflects the importance of cultivating leadership that promotes a collaborative and stimulating work environment to maximize the creative potential of employees (Joo et al., 2022).

A critical analysis of research references on the relationship between learning in the workplace and knowledge management

The authors Linde and Margaryan stand out as exemplary references in the relationship between learning in the workplace and knowledge management, being recognized for their impact and productivity, respectively. Their work is distinguished by its influence, as they delve into the relationship between narratives and social tacit knowledge. This provides a solid theoretical basis for understanding how stories can be effective tools for knowledge transfer in work environments (Linde, 2001). Conversely, a framework that offers valuable guidance for organizational learning from workplace incidents was significantly contributed, systematically addressing knowledge management in critical situations (Margaryan et al., 2012). Both works have left a lasting mark on research, establishing Linde C and Margaryan A as leading figures at the intersection of organizational learning and knowledge management. Jovanovic's prominence is based on his research into the development of a semantic web-enabled tool for self-regulated learning in the workplace (Siadaty et al., 2011). This study highlights the importance of emerging technologies to support self-regulated learning and improve the effectiveness of workplace training programs.

In addition, it was observed that the most productive and impactful journals in the field were the Journal of Knowledge Management, the Journal of Workplace

Learning, and The eLearning Organizational. Education + Training also demonstrated a high impact, while Ceur Workshop Proceedings exhibited high productivity. The scientific journals Journal of Knowledge Management, Journal of Workplace Learning, and The Learning Organization have a significant influence in the field of learning in the work environment and knowledge management. For instance, a study on tacit knowledge and narrative provides a profound comprehension of the manner in which knowledge is disseminated and constructed within organizations through narrative and tacit knowledge (Linde, 2001).

Similarly, the Journal of Workplace Learning investigates the means of facilitating self-regulated learning in the workplace, emphasizing the significance of strategies to promote collective learning and collaborative knowledge in work environments (Littlejohn, Milligan and Margaryan, 2012). Regarding The Learning Organization, the relationship between organizational learning and knowledge management was analyzed, providing a comprehensive perspective on how organizations can improve their learning capacity and leverage their knowledge for innovation and organizational success (Firestone and McElroy, 2004).

In addition, the journals Education + Training and Ceur Workshop Proceedings have also made a significant contribution to the advancement of knowledge in this area. For example, Education + Training examines e-learning markets and providers, addressing issues crucial to the design and effective implementation of training programs in workplace environments (Fry, 2001). Conversely, Ceur Workshop Proceedings examine the use of semantic web and linked learning to support learning in the workplace, offering novel perspectives and innovative approaches to enhance the efficacy of organizational learning (Siadaty et al., 2012). These journals have been instrumental in promoting research and debate in the field of workplace learning and knowledge management, providing a forum for the dissemination of knowledge and best practices.

Finally, it was found that the countries that have stood out in scientific production have been the United States, the United Kingdom, Australia, and Austria, which have appeared in terms of impact and productivity. Taiwan has also stood out in impact, while Germany has been a reference in terms of scientific production. Countries prominent in scientific production, such as the United States, the United Kingdom, Australia, and Austria, have played a fundamental role in advancing knowledge about learning in the workplace and knowledge management. For instance, a study on the leveraging of organizational learning for knowledge and performance (Cavaleri, 2004) highlights how organizations in the United States have been pioneers in adopting organizational learning practices to improve their performance. Similarly, in the United Kingdom, a framework for learning from incidents in the workplace (Lukic, Littlejohn and Margaryan, 2012) presents a focus on safety and continuous improvement through organizational learning.

Australia, on the other hand, has distinguished itself by establishing partnerships between universities and corporate organizations for the purpose of knowledge sharing and collaboration in order to improve workplace learning (Gustavs & Clegg, 2005). Austria has also contributed to competency modeling in order to support work-integrated learning, thereby highlighting its focus on the effective integration of education and work in the context of the knowledge economy (Ley et al., 2008).

In contrast, Taiwan and Germany have also made notable contributions to the field of workplace learning and knowledge management. In Taiwan, the factors influencing the acceptance of e-learning were explored (Cheng et al., 2012). Similarly, in Germany, a mobile application was developed to record learning experiences in nursing practice (Becker et al., 2012). These countries have made a significant contribution to the body of knowledge on the promotion and improvement of learning in the workplace from diverse perspectives and with innovative approaches.

A thematic analysis of the evolution of the relationship between workplace learning and knowledge management.

Thematic analysis reveals a significant shift in the conceptual approach to research on workplace learning and knowledge management. In 2000, the central concept of "training" occupied a prominent place, with the initial approach emphasizing the importance of continuous training and organizational learning as essential components for developing skills and improving performance in the work environment (Pate et al., 2000).

In contrast, in more recent years, particularly in 2022 and 2023, there is a shift towards broader and more complex concepts, such as "work environment," "transactional leadership," among others. These changes are reflected in contemporary research such as (Joo et al., 2022) and (Cai et al., 2023). The study by Joo et al. emphasizes the significance of enabling leadership and its impact on employee creativity, exploring the mediations of work engagement and knowledge sharing. Conversely, the research by Cai et al. examines the influence of transactional leadership on creative behavior with an ecological approach, underscoring the importance of green knowledge management and learning in the workplace.

Thematic Cluster Analysis of the Relationship Between Workplace Learning and Knowledge Management

By analyzing the keyword co-occurrence network, thematic clusters were identified that reveal conceptual affinities between terms relevant to learning in the work environment and knowledge management. The main cluster, represented by the color purple, is made up of terms such as Knowledge management, Universities, Partnership and Training, suggesting a close relationship between knowledge management, academic institutions and workplace training practices, This partnership is supported by research that explores the importance of university-business partnerships, as well as the need to rethink workplace learning beyond mere training, toward a broader approach to skills development and knowledge management (Garnett , 2001; Garrick, Chan & Lai, 2004; Smith, 2000)

In contrast, the second most significant cluster, identified by the color red, encompasses terms such as Knowledge Transfer, National Health Service, Case Study, and Learning, suggesting a particular focus on the transfer of knowledge within specific contexts. Research has addressed the implementation of knowledge transfer in various contexts, including healthcare. The first area of focus is the role of managed learning environments in the healthcare sector and the contributions of knowledge management to workplace learning (Gray, Plaice & Hadley, 2009; Veng Seng, Zannes & Wayne Pace, 2002). These studies underscore the importance of understanding and facilitating

effective knowledge transfer to improve clinical practice and promote professional development in healthcare settings.

An analysis of the frequency and conceptual validity of the relationship between learning in the workplace and knowledge management

Quadrant 2 of the Cartesian plane, composed of emerging concepts at the intersection of workplace learning and knowledge management, highlights two fundamental keywords: "Social Media" and "Learning Processes." These emerging concepts reflect the growing relevance of social networks and learning processes in the contemporary work environment. The significance of social networks as collaborative media in workplace learning was also investigated in their work, "Social Media as Collaborative Media in Workplace Learning," published in Human Resource Development Review. The study emphasizes the potential of social media platforms as effective tools for fostering collaborative learning, facilitating communication and interaction between employees (Thomas and Akdere, 2013). Conversely, it contributed to the understanding of learning processes in the work environment in research that highlights the importance of mapping collective knowledge to support self-regulated learning in the workplace. This research also highlights the need for strategies that promote the acquisition and effective application of knowledge (Margaryan, 2012).

Classification of keywords on the relationship between workplace learning and knowledge management according to their function

Table 1, presented in this study, plays a crucial role in providing a comprehensive classification of the top emerging and growing keywords related to the intersection between workplace learning and knowledge management. This classification is carried out according to its function, which allows a detailed identification of the main characteristics and applications of each categorized function. The table serves as an essential tool for organizing and understanding key trends in the literature, providing a structured view of thematic evolution in the field of study. Furthermore, this classification facilitates the identification of specific functions that have gained relevance, thus contributing to a deeper understanding of the research dynamics in the relationship between workplace learning and knowledge management.

Table 1

Classification of keywords according to their function

Keyword	Associated Tools	Applications	Characteristics
Social Media	Social networks, Online collaboration platforms	Corporate communication, Collaborative learning	Interaction in real time, Facilitates communication
Learning Processes	Learning models, Teaching strategies	Skill Development, Performance Improvement	Adaptability, Personalized approach
Semantic Web	Ontologies, Linked Data, Semantic Web	Information retrieval, Data integration	Semantic interconnection, Facilitates interpretation
Education	Online learning	Distance education,	Global Access, Learning

Networks	platforms, MOOCs	Virtual collaboration	Flexibility
Informal Learning	Work-based learning, Unstructured learning	Professional development, Knowledge transfer	Flexibility, Contextualization in work environments

The table presents a detailed categorization of the most significant keywords in the field of the relationship between workplace learning and knowledge management. Each key term is presented along with associated tools, main applications, and distinguishing characteristics, providing a summary of its relevance within the context of bibliometric research.

Limitations and practical implications

It is important to note that despite the meticulous application of the PRISMA-2020 methodology and the use of tools such as Scopus and Web of Science, as well as Microsoft Excel® and VOSviewer®, certain limitations exist in the present study. First, the selected databases may not cover the entire scientific production related to the relationship between workplace learning and knowledge management, which could lead to the omission of relevant contributions. Furthermore, the inclusion of specific keywords in the search strategy could have affected the completeness of data collection. Likewise, the choice of bibliometric indicators can influence the interpretation of the quantity and quality of publications. Although the PRISMA-2020 methodology has been followed, the subjectivity inherent in the selection of studies and the interpretation of results could also introduce some bias. These limitations should be taken into account when interpreting the findings and offer opportunities for future research that addresses these potential restrictions.

The relationship between workplace learning and knowledge management is a significant area of interest in the field of organizational management. The evolution of the conceptual framework, which has shifted from topics such as training, universities, and technology towards a more detailed consideration of aspects associated with workspace productivity, tacit knowledge, work environment, transactional leadership, and other related topics, reflects an adaptation to the changing demands of the contemporary work environment. This environment emphasizes more holistic and contextual aspects of organizational learning.

The analysis of the frequency and validity of keywords highlights the evolutionary dynamics of research in this area. While traditional concepts such as Learning Organizations and Learning show a decline in their conceptual relevance, the emergence of terms such as Social Media, Learning Processes, Semantic Web, and Education Networks reflects the growing influence of technology and networks on organizational learning processes. Conversely, the growing significance of concepts such as informal learning underscores the necessity to acknowledge and capitalize on unstructured forms of knowledge acquisition within the workplace.

Theoretical Implications

This bibliometrics offers valuable theoretical implications that contribute to the understanding and advancement of the field. By analyzing the frequency of publications

per year, the temporal dynamics of the research can be observed, identifying possible trends and emerging areas of interest over time. This temporal perspective allows for a deeper understanding of the evolution of the field and how it has responded to changes in the work environment and knowledge management practices.

The main theoretical references identified in bibliometrics provide a solid conceptual framework for understanding the underlying dynamics in the relationship between learning and knowledge management. These theoretical references not only inform current research but also point out areas of convergence and divergence in perspectives. In addition, the analysis of thematic evolution allows us to identify how certain topics have gained or lost relevance over time, providing crucial information on future research trends and directions.

The co-occurrence of keywords reveals the conceptual relationships between different terms and topics within the field of learning in the work environment and knowledge management. This analysis allows the identification of areas of convergence and divergence in the literature, as well as the identification of the most relevant concepts and recurring themes in the field. Similarly, the analysis of emerging and growing keywords provides information on the topics and research areas that are gaining importance in the field, pointing out possible future directions for research.

However, one of the most significant aspects of bibliometrics is the identification of research gaps. These gaps represent underexplored or poorly understood areas within the field of learning in the work environment and knowledge management. They suggest opportunities for future research. By identifying these gaps, researchers can direct their efforts toward areas of study that can have a greater impact on theory and practice. This contributes to the advancement of the field as a whole. It provides a holistic view of the current state of knowledge. It identifies areas of opportunity and points out possible directions for future research, thus enriching the theoretical and practical body of knowledge in the field of learning in the work environment and knowledge management.

Investigative gaps

Table 2 presents the main research gaps identified in the relationship between learning in the work environment and knowledge management. These gaps represent underexplored or insufficiently understood areas within the field, which require attention in future research to advance knowledge and understanding of the topic.

Table 2: *Research gaps*

Category	Investigative Gap	Justification	Questions for Future Research
Thematic gaps	1. The Impact of Artificial Intelligence on Learning in the Work Environment	The integration of artificial intelligence in the workplace presents both unknown challenges and opportunities for knowledge management.	How can artificial intelligence optimize learning and knowledge management processes in organizations?
	2. Informal Learning and Knowledge Management	The phenomenon of informal learning represents a significant source of knowledge within organizational contexts. However, there is a clear need to gain a deeper understanding of the most effective methods for managing this phenomenon.	What strategies can be employed to capture and disseminate the knowledge generated through informal learning in the workplace?
Geographic gaps	1. Specific cultural contexts	The majority of research in this field is conducted in Western contexts, which limits our understanding of the diversity of learning practices across cultures.	What are the distinctions between learning and knowledge management practices in different cultural and geographic contexts?
	2. Developing countries	The paucity of empirical research conducted in developing countries impedes our capacity to comprehend the distinctive challenges and	What are the specific obstacles and enablers to learning and knowledge management in developing countries?

		prospects inherent to these work environments.	
Interdisciplinary gaps	1. Integration of organizational psychology	The absence of integration with organizational psychology impedes our comprehension of the psychological dimensions of learning in the workplace.	What are the specific effects of individual psychological factors on the acquisition and transfer of knowledge in the workplace?
	2. Intersection with labor sociology	The paucity of interdisciplinary research hampers our comprehension of the sociological elements that shape organizational learning.	How do social structure and labor relations affect learning and knowledge management in organizations?
Temporary gaps	1. Long-term effects of knowledge management practices	The absence of longitudinal studies precludes a comprehensive comprehension of the long-term consequences of knowledge management initiatives.	What impact do past knowledge management strategies have on future organizational performance?
	2. Emerging Trends in Organizational Learning	The paucity of research on emerging trends constrains our capacity to anticipate and adapt to alterations in organizational learning.	What are the novel forms of learning that are emerging in the workplace, and how will they impact knowledge management?

Table 2 identifies thematic, geographical, interdisciplinary, and temporal gaps in the existing research. It is essential to close these gaps in order to advance the understanding of how knowledge is developed and managed in the work environment, and how these practices influence organizational performance and the continuous improvement of workers' skills and competencies.

Research agenda

The proposed research agenda is the result of an analysis of the 30 key concepts identified in Figure 9, which represent fundamental aspects at the intersection between workplace learning and knowledge management. These concepts have been selected to offer a comprehensive and up-to-date view of the challenges and opportunities in this field. The agenda aims to provide a strategic guide for future research, highlighting priority areas and promising lines of research that can significantly contribute to the advancement of knowledge in this area.

In the current work environment, where information has become a strategic resource, the ability to effectively share knowledge can drive innovation and productivity within organizations. For future research, it would be relevant to explore how technologies of information and communication influence knowledge exchange processes in specific work environments, as well as identify the barriers that hinder this process and propose strategies to overcome them.

Teachers, whether formal or informal, play a fundamental role in the transmission of knowledge and skills in the work environment. Future research could focus on understanding how organizations can identify, develop, and retain the best teachers within their teams. Additionally, studies examining the impact of teacher training on improving organizational performance could provide empirical evidence on its importance in knowledge management. Furthermore, studies could explore how mentoring and coaching can be used effectively to promote employee learning and development.

The importance of informal learning, which occurs in an unstructured and unplanned manner in the workplace, is increasingly recognized as a vital component for the development of skills and competencies. Future research could focus on understanding how organizations can encourage and support learning in this manner. This could include identifying the conditions that promote an environment conducive to this type of learning, such as organizational culture and leadership.

Workplace learning is a crucial aspect of ensuring the continuous adaptation and improvement of work skills in a constantly changing business environment. By examining the integration of different types of learning, such as formal, informal, and self-directed learning, within knowledge management practices, we can gain a deeper understanding of how organizations can fully leverage the potential of their human resources for organizational success.

Organizational learning is a key factor in the ability of an organization to adapt and evolve in response to changes in the external environment. Future research could focus on identifying the organizational practices and structures that foster a culture of continuous learning, as well as evaluating the impact of these initiatives on the ability of organizations to innovate and compete in a global market.

Training in the workplace is a fundamental tool for the development of specific skills and the transfer of knowledge within organizations. In order to advance in this field, it would be relevant to investigate how new technologies, such as virtual reality

and artificial intelligence, can be used to improve the effectiveness and efficiency of workplace training. Furthermore, it would be beneficial to identify best practices for designing training programs that maximize learning and retention.

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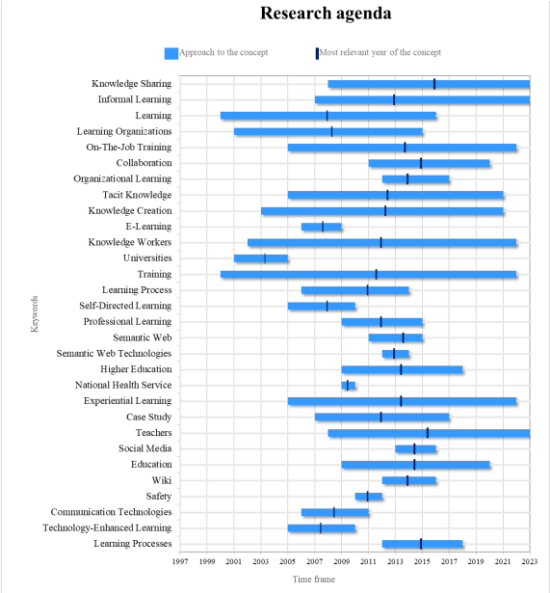
Collaboration between employees is fundamental for knowledge sharing and problem solving in complex work environments. Future research could explore how organizational structures and technological tools can be designed to foster effective collaboration between work teams, as well as identifying the factors that promote or inhibit collaboration within organizations.

Organizational learning refers to the process by which organizations acquire, share, and use knowledge to adapt to changes in their environment. To advance in this field, it would be valuable to investigate how knowledge management practices can be designed to foster a continuous cycle of learning and improvement within organizations. Additionally, it would be beneficial to identify the cultural and structural factors that influence the ability of organizations to learn and adapt.

Tacit knowledge, or implicit knowledge that is difficult to formalize, plays a crucial role in the functioning of organizations. This knowledge often resides in the individual experiences and skills of employees. Future research could focus on identifying effective strategies to capture, share, and utilize tacit knowledge within organizations. Additionally, research could examine how this type of knowledge influences decision-making and innovation in the workplace.

Figure 9: *Research agenda*



Alt text figure 9. Visualization that describes a research agenda identifying priority topics, developed with data from Scopus and Web of Science.

Conclusions

The conclusions drawn from bibliometrics on the relationship between workplace learning and knowledge management offer a comprehensive view of the evolution and dynamics of this research field. The identification of critical years, such as 2009, 2012, 2013, and 2022, points to notable moments of scientific interest and development, indicating periods in which the academic community has significantly focused its attention. This temporal pattern provides a foundation for understanding how research at the intersection of workplace learning and knowledge management has evolved.

In terms of growth, the scientific literature shows a linear trend, which suggests a constant and sustained interest in the topic over time. This finding highlights the continued relevance of the relationship between workplace learning and knowledge management in academic and professional settings. Furthermore, the identification of key references, such as authors Margaryan A, Linde C and Littlejohn A, the journals the Journal of Knowledge Management and the Journal of Workplace Learning, and countries such as the United States, the United Kingdom, Australia and Austria, provides valuable guidance for those seeking to delve deeper into this area. It is important to recognize these authors as influential leaders in research.

The thematic evolution reflects a significant shift from early training-focused research toward more contemporary topics such as the work environment and transactional leadership. This change indicates an adaptation to the changing demands of the work environment, where the integration of new perspectives is essential. Emerging and growing keywords, such as social media, learning processes, the semantic web, and, especially, informal learning, highlight current and future trends in research, underscoring the importance of technological aspects and informal forms of learning.

Similarly, the implications derived from this bibliometrics, and the proposed agenda underscore the necessity to address significant research gaps to advance the understanding of learning in the work environment and knowledge management. The identification of these gaps provides a valuable guide for future studies that seek to strengthen the theoretical and practical body in this field, addressing emerging themes, geographical, interdisciplinary, and temporal aspects to promote effective organizational learning and strategic knowledge management.

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