

Mural Art Research: A Bibliometric Overview

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ABSTRACT

This study explores the scholarly trajectory of mural research within the domains of public art, heritage, and urban studies, emphasizing its role in shaping identity, promoting community engagement, and contributing to sustainable regeneration. A bibliometric review was conducted on 345 Scopus-indexed publications spanning the years 1976 to 2025, with visualization techniques employed to examine publication output, collaboration networks, institutional contributions, and thematic structures. The results reveal a steady expansion of mural scholarship, with a significant rise in research activity after 2018. Leading contributions are concentrated in countries such as China, the United States, and the United Kingdom, reflecting diverse academic traditions and cultural contexts. Keyword mapping identifies eight major clusters, encompassing themes of heritage conservation, tourism development, education, social engagement, and digital innovation, thereby illustrating the broadening scope of mural studies in both traditional and contemporary discourse. Despite this growth, international collaboration remains relatively limited, highlighting the need for stronger interdisciplinary and cross-regional partnerships. By presenting the first large-scale mapping of mural scholarship, this study provides an overview of its historical development, current intellectual landscape, and potential directions for advancing sustainable cultural and urban initiatives. The findings establish a foundation for positioning mural research as a dynamic and impactful area of academic inquiry.

1. INTRODUCTION

Murals are one of the most visible forms of public art, deeply embedded in cultural and political expression. The social impact of mural creations is evident in various urban settings (Irwandi et al., 2020), and the arts, including murals, are acknowledged for their role in community development and the regeneration of areas (Kay, 2000). This aligns with Zhou (2024) who views murals in contemporary cities as serving broader roles in placemaking. Public art can renew urban spaces and foster local identity and community involvement (Zhou et al., 2024). Indeed, case studies show that mural creation can strengthen community bonds and contribute to sustainable urban development (Petronienė & Juzelėnienė, 2022). Since murals exist in the streets rather than galleries, they enable artists to engage directly with diverse audiences and even serve as a medium for public dialogue. Public art's accessibility and potential to unite diverse individuals grant it

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the capacity to create significant and lasting impacts on cities, places, and the lives of people (Cheung et al., 2022). Observers note that city walls can become “channels of communication” for social messages, turning protests and community needs into visible discussions in public space (Columbia Climate School, 2021).

In recent years scholars have approached murals from many angles. Conservation science and heritage studies have examined mural materials, deterioration and restoration techniques (Zhu et al., 2022). Cultural studies highlight how murals contribute to urban identity and narrate local history (Zhou et al., 2024). Other research treats murals explicitly as tools of social and political commentary. For example, protest murals often carry explicit grievances, slogans or demands that would otherwise lack a public forum (Columbia Climate School, 2021). At the same time, new technologies are shaping mural research. Studies have explored digital documentation methods and augmented-reality overlays to augment mural experiences and have applied machine learning and virtual reality to analyze and even restore wall paintings (Wang & Wu, 2023; Young & Marshall, 2023). Technology can facilitate educational experiences, allowing audiences to interact with historical artifacts and sites, even those difficult to access in real life (Soto-Martin et al., 2020).

Because of this diversity, mural studies are intrinsically interdisciplinary, overlapping art history, architecture, urban planning, visual culture and more. Bibliometric analysis offers a way to map this evolving field. By quantifying publications and citations, bibliometrics can reveal the major themes, influential authors, and collaboration patterns in mural research. In fact, recent work has applied bibliometric mapping to art and heritage topics. For example, Zhu et al. (2022) gathered 845 articles on wall painting analysis (2011 until 2021) to visualize keyword trends and author networks in heritage science (Zhu et al., 2022). Such studies demonstrate how bibliometrics can consolidate fragmented literature and suggest future directions.

In this paper we undertake a bibliometric review of mural scholarship using Scopus-indexed literature. We chart trends in publication output, leading authors and institutions, and international collaboration. We also construct keyword co-occurrence networks to delineate the intellectual structure of the field. This combined mapping and review will highlight dominant topics (e.g. conservation techniques, community murals, digital methods) as well as gaps awaiting further study. Overall, the goal is to provide researchers and policymakers with a comprehensive overview of how mural art is being studied and applied, and how the field has evolved.

2. RESEARCH METHOD

Systematic literature review employing a bibliometric approach quantitatively assesses literature to discern trends, patterns, and key research entities within a discipline. Using frameworks such as PRISMA, it offers a comprehensive, transparent, and thorough systematic review (Fleming et al., 2014). The inclusion criteria established were: (1) focusing on the topic of Mural, (2) articles published up until September 18, 2025, (2) publications in English, Journal source type and the Social Science subject area. Bibliometric analysis was performed using VOSViewer, visualizing bibliographic data to analyze the collaboration network of countries, citation networks, and author collaborations, revealing the intellectual structure and dynamics of the research field. According to Tranfield et al. (2003) and Filser et al. (2019), both bibliometric analysis and SLR have acquired prominence due to the effort in the process that seeks to be rigorous, replicable, scientific and transparent, to continuously improve the quality of the review through the explicit, systematized and replicable use of search methods. The integration of both approaches provides a comprehensive understanding of the development, historical flow, and future direction of the research field, making it highly beneficial in interdisciplinary studies for gaining deeper insights. Bibliometric analysis is also used for strategic purposes in scholarly publications to evaluate scientific journals based on their economic weight.

Furthermore, the Scopus database is employed by researchers for a myriad of investigational purposes, including the execution of literature reviews, identifying subject-matter experts, and monitoring research trends.

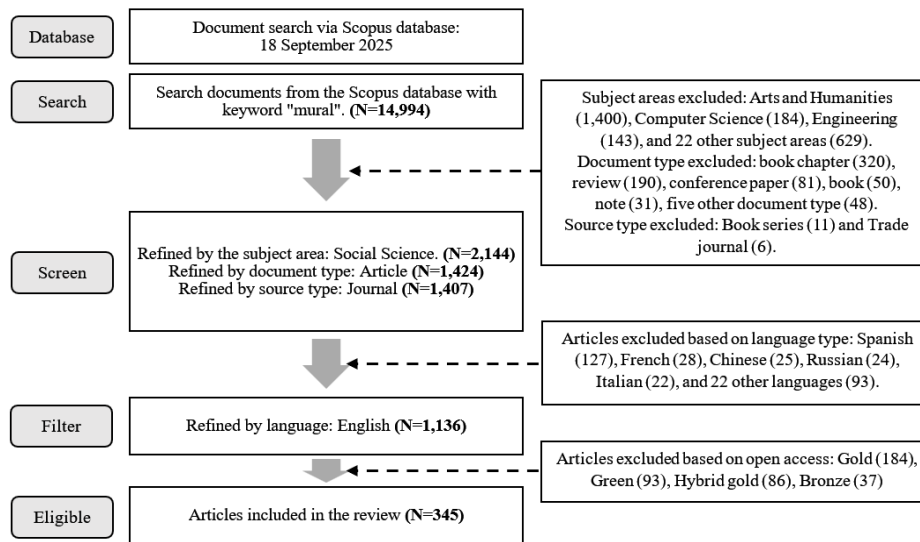


Fig. 1. Systematic Literature Review information flow using PRISMA
Source: Author, 2025

The Scopus database was employed for this analysis as it is one of the most comprehensive and reliable indexing platforms for peer-reviewed literature across multiple disciplines. Scopus is among the largest curated abstract and citation databases, with a wide global and regional coverage of scientific journals, conference proceedings, and books, while ensuring only the highest quality data are indexed through rigorous content selection and re-evaluation by an independent Content Selection and Advisory Board (Baas et al., 2020). This careful selection of sources and continuous monitoring of data quality contribute to its global credibility (Aroyewun et al., 2022; Shakhshir et al., 2023). The database indexes publications from high-quality journals with effective peer-review mechanisms and editorial oversight, further solidifying its reliability (Shakhshir et al., 2023). Its extensive coverage, compared to other databases like Web of Science, includes a vast amount of scientific literature, making it a preferred choice for many bibliometric studies (Chadegani et al., 2013; Rejeb et al., 2023). Researchers often select Scopus for bibliometric analysis due to its extensive coverage of scientific literature from various publishers and its utility in analyzing research trends across disciplines (Shakhshir et al., 2023). This enhances the validity and reliability of the study's findings by providing access to high-quality publications in the fields of cultural tourism, heritage preservation, and visual arts. Furthermore, Scopus offers integrated tools that facilitate bibliometric analysis, enabling researchers to efficiently identify publication trends, research clusters, and knowledge gaps. Restricting the study to Scopus also ensures consistency and cohesiveness in data aggregation and analysis, streamlining the research workflow while maintaining methodological rigor. Given the study's objective of mapping the research status and development trends of mural art in tourism and heritage contexts, Scopus provides the most suitable data source to support this bibliometric investigation.

3. RESEARCH RESULTS AND DISCUSSION

3.1 Annual Volume of Publications and Trends

345 academic articles retrieved and analyzed in this study were published in Scopus-indexed journals, reflecting the growing scholarly interest in murals within the social sciences subject area. Fig. 2 illustrates the temporal distribution of publications from 1976 to 2025.

The publication trend can be broadly divided into three phases. The initial exploratory stage (1976 - 2010) recorded only sporadic publications, indicating that mural research was still in its infancy and not yet widely recognized as a

significant area of academic inquiry. The formative growth stage (2011 - 2018) saw a gradual increase in output, aligning with the rising global attention toward public art. The most notable expansion is observed in the rapid development stage (2019 - 2025), with publications growing sharply year by year and peaking at more than 60 articles in 2025. Overall, the strong upward trajectory, particularly after 2018, highlights murals as an emerging research frontier that is rapidly consolidating into a recognized scholarly field.

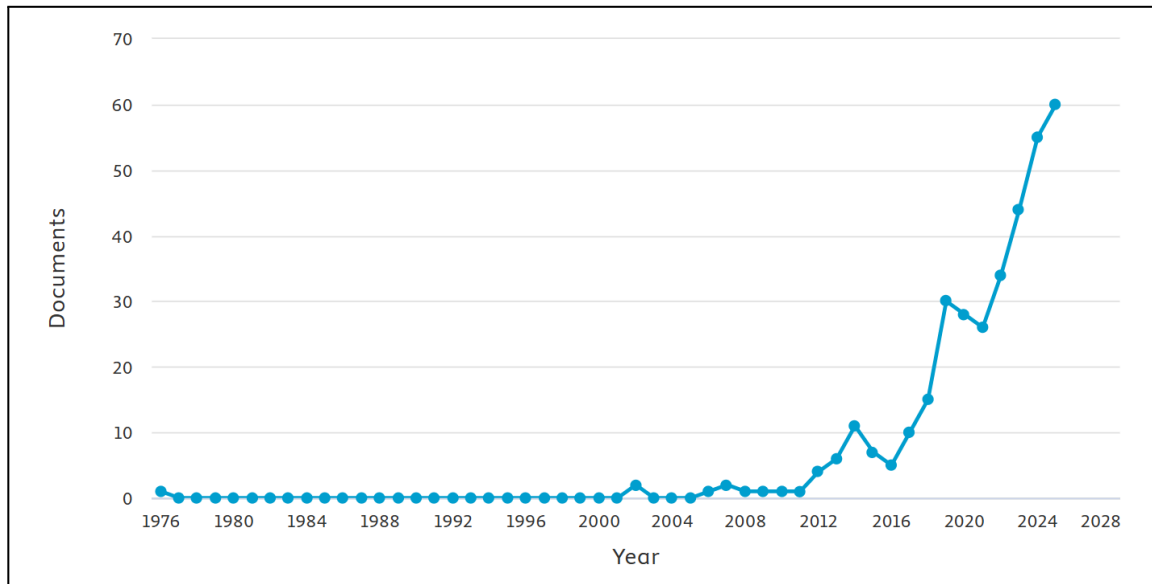


Fig. 2. Annual publications from 1976 to 2025

Source: VOSviewer analysis result, 2025

3.2 Scientific Collaboration Network

National and Institutional Collaboration Networks

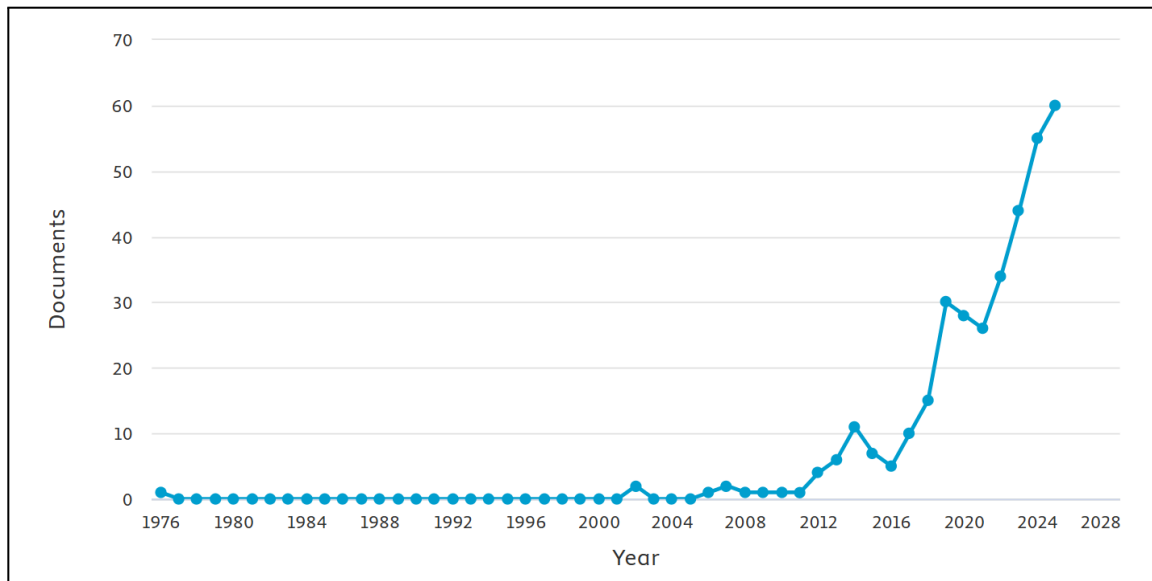


Fig. 3. Network Country Visualization

Source: VOSviewer analysis result, 2025

To identify the most influential contributors to mural research, this study examined the publication output across countries. Figure 3 (visualized through VOSviewer) illustrates the collaboration network, where node size reflects

publication volume, connecting lines indicate collaboration strength, and node colors represent clusters of countries with strong cooperative ties (Liu et al., 2025). The results demonstrate that the research landscape is concentrated in a limited number of countries, while many others remain peripheral with weaker or no international collaboration. This indicates that although cross-national partnerships exist, the global collaboration network in mural-related tourism and heritage research is not yet highly cohesive.

Table 1. Top countries ranked by number of publications

Rank	Country	Number of Publications	Citations	Citations per Paper
1	China	89	731	8.21
2	United States	44	371	8.43
3	United Kingdom	37	229	6.19
4	Spain	21	152	7.24
5	Italy	15	142	9.47
6	Poland	17	48	2.82
7	Germany	11	80	7.27
8	Malaysia	10	70	7.00
9	Mexico	10	13	1.30
10	France	9	47	5.22
11	Canada	4	34	8.50
12	South Africa	4	8	2.00

Table 1 presents the top contributing countries. China leads the field with 89 publications and 731 citations, highlighting its central role and strong research productivity. The United States follows with 44 publications and 371 citations, underscoring its influence through both output and citation impact. The United Kingdom ranks third, producing 37 publications and 229 citations, reflecting its growing academic interest in cultural tourism and heritage preservation through art. Spain also makes a significant contribution, with 21 publications and 152 citations, positioning it as an active European hub. Other countries such as Germany (11 publications, 80 citations), Malaysia (10 publications, 70 citations), and Italy (15 publications, 142 citations) also contribute meaningfully, although their citation counts remain moderate compared to China and the US.

Overall, while China and the United States dominate in terms of output and influence, the spread of publications across Europe, Asia, and North America suggests that mural and tourism studies are gradually evolving into a globally shared research domain. However, the relatively fragmented collaboration networks highlight the need for stronger international partnerships to advance knowledge integration in this field.

Table 2. Top institutions ranked by number of publications

Rank	Country	Country	Number of Publications	Citations	Citations per Paper
1	Xinzhou Teachers University	China	12	140	2018
2	Taiyuan University of Science and Technology	China	12	140	2018
3	Northwest University	China	10	91	2013
4	Ministry of Education of the People's Republic of China	China	8	36	2014
5	Beijing University of Civil Engineering and Architecture	China	7	58	2021
6	Dunhuang Academy	China	6	30	2023
7	Yunnan University	China	6	54	2022
8	Universidad Nacional Autónoma de México (UNAM)	Mexico	6	5	2021

9	Università degli Studi di Torino	Italy	5	52	2018
10	Ulster University	United Kingdom	5	46	2017
11	Uniwersytet Jagielloński (Jagiellonian University)	Poland	5	9	2018
12	National Research Center for Conservation of Ancient Wall Paintings and Earthen Sites	China	4	25	2022

In terms of issuing institutions, universities and public research organizations are the primary contributors to mural research. This field covers a diverse set of institutions, with Table 2 listing the top 12 institutions in terms of publication output. The top seven institutions are all located in China, namely Xinzhou Teachers University (140 citations, 12 publications) and Taiyuan University of Science and Technology (140 citations, 12 publications), both emerging strongly since 2018. This is followed by Northwest University (91 citations, 10 publications) and the Ministry of Education of the People's Republic of China (36 citations, 8 publications), which have also contributed significantly to the field since 2013 and 2014 respectively. More recent contributors include the Beijing University of Civil Engineering and Architecture (58 citations, 7 publications), Dunhuang Academy (30 citations, 6 publications), and Yunnan University (54 citations, 6 publications), reflecting the rapid growth of Chinese institutional research in this area over the last decade. In addition, Universidad Nacional Autónoma de México (5 citations, 6 publications), showing active participation in the field. European institutions such as Università degli Studi di Torino (52 citations, 5 publications), Ulster University (46 citations, 5 publications), and Uniwersytet Jagielloński (9 citations, 5 publications) also appear among the top contributors. Furthermore, the National Research Center for Conservation of Ancient Wall Paintings and Earthen Sites (25 citations, 4 publications), reflects its specialized focus in heritage-related mural studies. Overall, these institutions form the backbone of research productivity, with Chinese universities dominating the top ranks, indicating the country's growing scholarly leadership in mural studies.

3.3 Author Collaboration Network

Table 3. Top authors ranked by number of publications

Rank	Country	Number of Publications	Citations	Citations per Paper
1	Cao, J.	12	140	11.67
2	Cui, H.	4	113	28.25
3	Li, W.	4	52	13
4	Rolston, B.	4	46	11.5
5	Yu, Y.	4	51	12.75
6	Aceto, M.	3	52	17.33
7	Ao, J.	3	32	10.67
8	Hokoi, S.	3	23	7.67
9	Hou, M.	3	53	17.67
10	Li, Y.	3	23	7.67
11	Lyu, S.	3	53	17.67
12	Mitrani, A.	3	5	1.67

Analyzing the authors of the literature provides valuable insights into the representative scholars and core research power in the field of mural studies. Table 3 lists the top authors with three or more publications and citations, highlighting their scholarly influence. The author with the highest number of publications is Cao, J., with a total of 12 journal publications, 140 citations, and an average of 11.67 citations per article. His research primarily focuses on mural conservation and heritage studies in China, where he has frequently collaborated with institutions such as Xinzhou Teachers University and Taiyuan University of Science and Technology. Following him, Cui, H. stands out with four publications but a notably high citation count of 113, averaging 28.25 citations per article, making him one of the most influential contributors in terms of impact. Similarly, Aceto, M. and Hou, M. demonstrate strong citation influence despite

having fewer publications, each averaging over 17 citations per paper. These authors represent a core group advancing mural research, particularly in the areas of conservation science, material analysis, and heritage interpretation. Collectively, their work reflects both the growth and the concentration of expertise in mural research, though collaboration networks across authors remain somewhat fragmented, indicating potential for stronger interdisciplinary and international cooperation in the future.

3.4 Distribution and Number of Journals and Disciplines

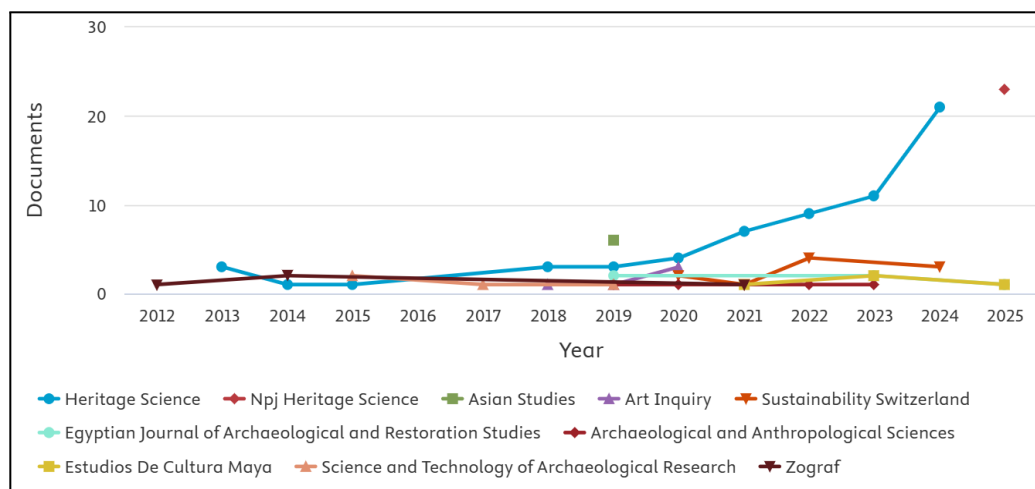


Fig. 4. Number of articles by source (Top 10 sources)
(Source: VOSviewer analysis result, 2025)

Heritage Science stands out with a strong upward trend, especially from 2020 onwards, reaching the highest annual document count among all sources in 2024 and showing significant growth in recent years. Most other journals, such as Npj Heritage Science, Asian Studies, and Art Inquiry, display relatively flat or modest publication trends, typically with one to three articles per year and no substantial increases. Notably, Sustainability Switzerland exhibits a sharp surge in 2025, suggesting an emerging interest in sustainability themes within heritage science for that year. Journals like Egyptian Journal of Archaeological and Restoration Studies and Estudios De Cultura Maya show minor year-to-year fluctuations, remaining steady in their output.

Subsequently, this multi-year data comparison supports identifying rising journals for literature reviews, targeting publication outlets, and understanding where influential research clusters are located. In result, the trends suggest Heritage Science is a leading journal for bibliometric analysis and literature synthesis, making it a strategic choice for tracking developments, citation analysis, and research dissemination. The recent increase in sustainability-themed publications points to shifting research priorities that may warrant further in-depth exploration for future studies. A balanced evaluation should also include journals with stable, long-term output to capture foundational and ongoing scholarly work in specialized heritage domains.

3.5 Research Hotspot and Trends

Keyword Co-occurrence and Clustering

This section presents the findings from the keyword co-occurrence and clustering analysis conducted using VOSviewer. The analysis was performed on a curated dataset of 345 articles retrieved from the Scopus database related to mural studies. Keywords were extracted from the author-provided keywords in these publications to identify the main research themes and their interrelationships. A minimum threshold of three occurrences per keyword was set to ensure analytical robustness and to focus on terms with sufficient representation in the literature.

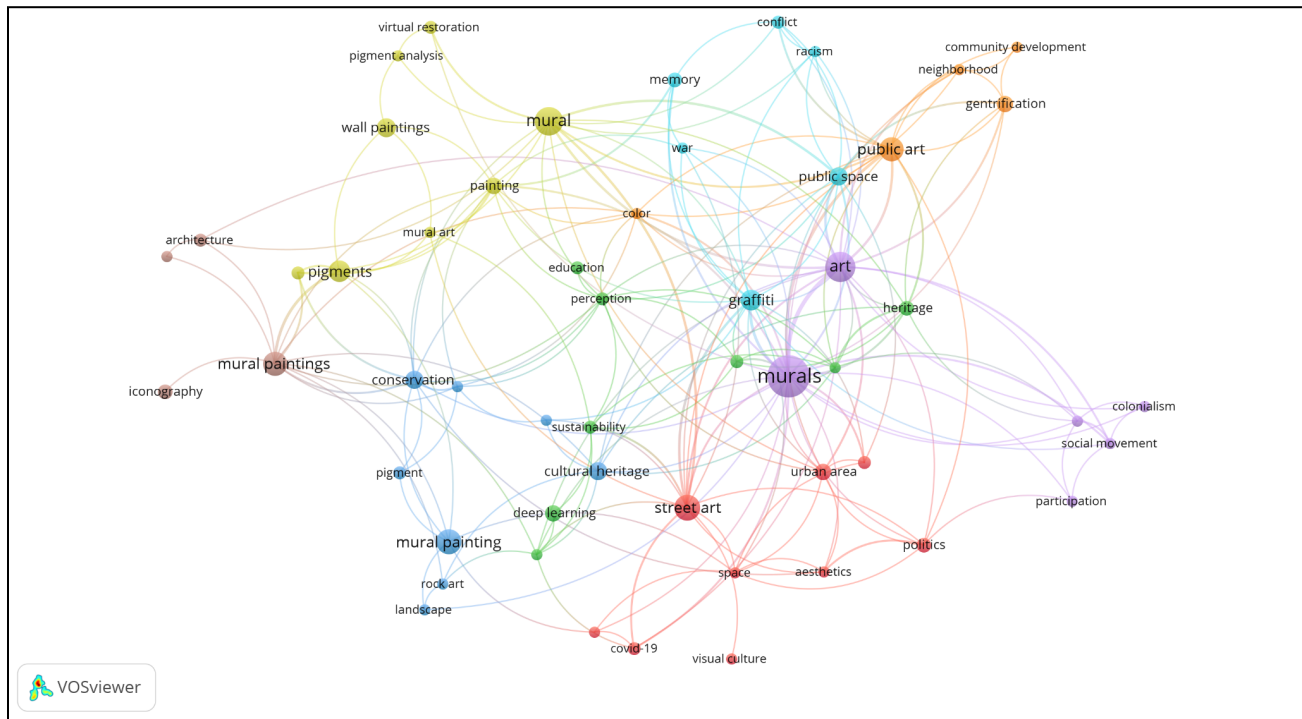


Fig. 5. Network Visualization

Source: VOSviewer analysis result, 2025

The overall network visualization of the keyword co-occurrence analysis revealed a total of 54 items (keywords) grouped into 8 distinct clusters, representing thematic research areas. The network comprises 204 links, indicating co-occurrence relationships between keywords, with a total link strength of 263, reflecting the cumulative strength of these connections.

The visualization shows several clusters of keywords or topics, each color-coded to represent a different thematic cluster or group. We can identify several distinct colors representing different clusters - for example, there appears to be a red cluster that includes keywords like "street art," "urban area," "politics," "aesthetics," "visual culture," and "covid-19", represents research intersecting urban spaces, political contexts, public engagement, and visual culture of street art, highlighting how these topics often co-occur and are discussed together. A blue and green cluster covers topics such as "conservation," "heritage science," "deep learning," "virtual restoration," and "sustainability", which emphasizes technological innovation, restoration processes, and the integration of scientific methods into heritage conservation. The lines between the nodes represent the strength and density of the relationships, with thicker lines typically indicating stronger associations. Specifically, Table 4 below describes the overall clusters and its items.

Table 4. Clusters and items

No	Items
1	Aesthetic, COVID-19, image, politics, space, street art, urban, urban area, visual culture.
2	Deep learning, education, heritage, heritage tourism, identity, image analysis, perception, sustainability.
3	Conservation, cultural heritage, heritage science, landscape, mural painting, muralism, pigment, rock art.
4	Deterioration, mural, mural art, painting, pigment analysis, pigments, virtual restoration, wall paintings.
5	Art, colonialism, empowerment, murals, participation, social movement.
6	Conflict, graffiti, memory, public space, racism, war.
7	Color, community development, gentrification, neighborhood, public art.
8	Architecture, iconography, mural paintings, restoration.

themes. Each node represents a keyword, with its size reflecting frequency and the connections representing co-occurrence strength.

From the visualization, studies (2018-2019, blue nodes) emphasized technical and heritage-related topics such as pigments, conservation, iconography, and mural paintings, highlighting the preservation and material aspects of murals. Moving into the mid-period (2020-2021, green nodes), the focus expanded toward broader cultural and social dimensions, including graffiti, street art, heritage, public art, and cultural heritage, reflecting a growing recognition of murals within urban and cultural tourism contexts. By the most recent years (2022-2023, yellow nodes), emerging topics such as gentrification, covid-19, architecture, and urban area gained visibility, signaling a shift toward contemporary issues linking murals with urban transformation, social participation, and post-pandemic cultural landscapes.

Overall, the overlay visualization suggests that mural tourism research has evolved from a primarily heritage-preservation orientation to a more multidisciplinary focus, engaging with social, cultural, and political dimensions. This trend highlights the potential of mural studies to move beyond technical conservation and engage with broader questions of community identity, urban development, and tourism innovation.

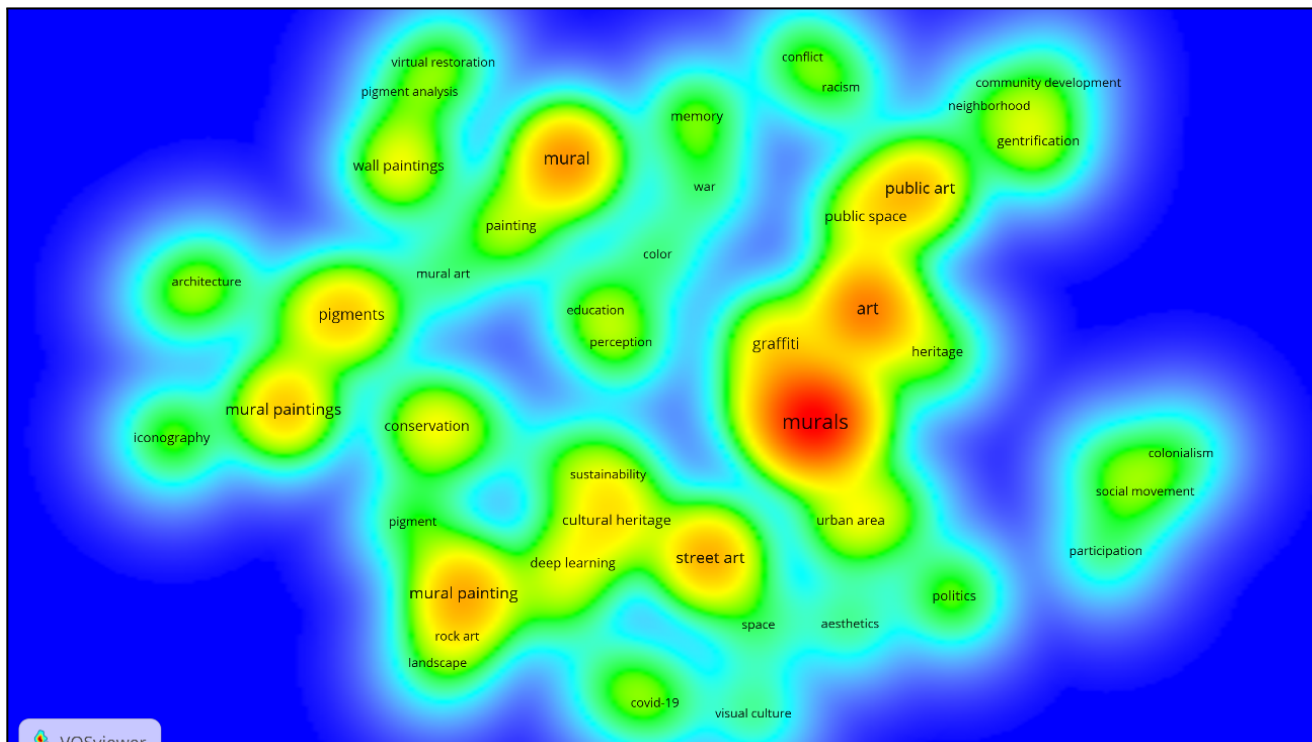


Fig. 7. Density Visualization

Source: VOSviewer analysis result, 2025

Fig. 7 shows the density visualization of keywords in mural related research. The map uses a color gradient to indicate the relative density of research topics, where warmer colors (red/yellow) represent areas with high keyword occurrence and research concentration, while cooler colors (green/blue) indicate lower density and less frequently explored topics.

The densest regions of the map highlight “murals,” “art,” “public art,” “graffiti,” and “mural paintings” as the most established and frequently discussed themes in the field. These clusters suggest that current research is strongly centered on murals as cultural and artistic expressions, their role in public space, and their intersections with heritage and street art. In contrast, less dense peripheral areas, such as virtual restoration, community development, gentrification, colonialism, and participation, appear in cooler tones. These topics, while connected to the central themes, remain underexplored and may represent emerging directions in mural tourism research.

4. CONCLUSION

This bibliometric study provides a comprehensive overview of the research landscape surrounding mural art, tracing its evolution, thematic concentration, and intellectual structure over the past five decades. The analysis of 345 Scopus-indexed publications highlights a significant growth trend, particularly after 2018, reflecting murals' expanding role in social, cultural, and technological discourse. China, the United States, and the United Kingdom emerged as dominant contributors, with Chinese institutions showing remarkable productivity in heritage and conservation-oriented research. The keyword and cluster analyses reveal that mural studies have transitioned from traditional art-historical narratives toward interdisciplinary domains integrating sustainability, digital innovation, and community engagement. However, the study also exposes fragmented international collaborations, indicating opportunities for greater global and cross-sectoral partnerships. Overall, this research not only maps the intellectual progress of mural scholarship but also establishes a foundation for future studies to explore its applications in cultural tourism, urban development, and creative industries, ensuring murals remain vital agents of social and cultural transformation.

This study is limited to English-language, Scopus-indexed journal articles, which may exclude valuable regional or non-indexed works that contribute to mural discourse. Future research could incorporate data from other databases such as Web of Science or Google Scholar to expand coverage and include multidisciplinary perspectives. Moreover, qualitative reviews and field-based analyses could complement bibliometric findings by providing deeper insights into mural creation, audience perception, and socio-economic impacts. Expanding collaboration between scholars, cultural institutions, and policymakers will be essential in advancing the theoretical and practical understanding of mural art within contemporary urban and cultural contexts.

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CONFLICT OF INTEREST STATEMENT

The author declares that this research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

AUTHORS' CONTRIBUTIONS

To ensure proper credit and accountability, the individual contributions of the authors are specified as follows:

Noorlida Daud: Provided overall leadership in framing the research objectives and guiding the analytical direction of the study.

Mat Redhuan Samsudin: Conceptualize and coordinate the overall project. Responsible for communication with the journal and ensuring the integrity of the final manuscript.

Nor Hisham Md Saman: Final approval of the version to be published and agreement to be accountable for all aspects of the work.

Noriza Mohd Saad: Drafting the work and revising it critically for important intellectual content

Sarman Mohamad: Provided technical assistance, data collection, and visualization support.

ETHICS STATEMENT

The authors declare that this research did not involve human or animal subjects.

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