

Exploring the Impact of Mural Arts on Information and Communication: A Recent Comprehensive Structured Review

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ABSTRACT

This systematic literature review explores the impact of mural arts on information and communication, highlighting their significance in conveying social narratives and fostering community engagement. Despite the increasing prevalence of murals as a medium for expression, a comprehensive understanding of their communicative role remains underexplored. After doing more in-depth searches in the Scopus and Web of Science databases, 28 relevant articles were found. These articles covered a wide range of topics, including the historical background, artistic techniques, and social and political effects of mural arts. The analysis emphasizes the artistic and functional dimensions of murals, revealing their effectiveness as tools for information dissemination and public discourse. The findings were divided into three themes, which are (1) mural art conservation and restoration, (2) mural art as a medium for communication, and (3) cultural perspectives and historical contexts of mural art. In conclusion, this literature review shows that mural arts have a big effect on how people think about them, how well they do in school, and how strong their communities are. It also calls for more research to fully understand how they can be used as tools for communication in different cultural settings.

Keywords: impact, mural art, communication, information, structured review

INTRODUCTION

Mural art has increasingly emerged as a significant medium for communication and information dissemination in diverse cultural contexts (Guillé, 2024; Polson, 2025). This art form, characterized by large-scale paintings or designs created directly on walls or ceilings, transcends the traditional boundaries of artistic expression by engaging with public spaces and communities (Murtono & Wijaya, 2021). Mural art offers unique opportunities to convey messages, provoke thought, and foster social change, rendering it an important subject for scholarly investigation (Bates et al., 2022; Haiou et al., 2024). As urban landscapes evolve and public spaces become increasingly central to civic life, understanding the role of mural art in communication not just as visual decoration but as an influential medium for informing and engaging communities is paramount (Carden, 2017; Vidali, 2024). This article seeks to explore the multifaceted impact of mural art through a recent comprehensive structured review of existing literature, aiming to capture its significance as a communicative tool in contemporary society (Medhavi & Trehan, 2023).

Throughout history, murals have served as vital forms of expression that reflect the values, struggles, and aspirations of communities. From ancient civilizations using murals to depict religious stories and historical events to modern, socially engaged art movements addressing contemporary issues, murals can resonate with audiences on profound levels. In recent years, scholars have increasingly recognized mural art's role in public discourse, examining its potential to shape collective identities and community narratives. This review brings together relevant research to show how mural art can improve communication by tackling popular social, political, and environmental issues (Armstrong et al., 2024; Cruzeiro et al., 2024; Thompson et al., 2023) and making it easier for people from different backgrounds to talk and think about these issues.

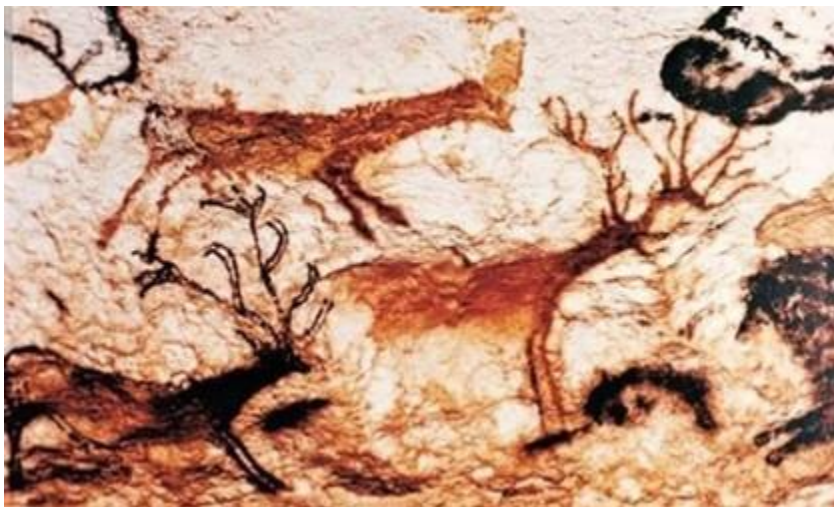
Moreover, the impact of mural art extends beyond mere aesthetic appreciation to include its ability to inform and educate viewers about pressing issues. Murals often serve as catalysts for community engagement and activism, illustrating stories and messages that might otherwise remain unheard. The integration of social media and digital platforms further amplifies the reach of mural art, allowing local artists to share their work with a global audience and foster interactions that enrich the interpretation of their messages (Sahabuddin & Hildayanti, 2024). By systematically reviewing recent literature, this article aims to analyze the contributions of mural art to communication and information, provide insights into its effectiveness, and explore best practices for future initiatives. Ultimately, this exploration will highlight the transformative power of mural art as a dynamic medium capable of fostering understanding and inspiring change in society.

LITERATURE REVIEW

History of Mural Painting

Mural painting, or wall art, is a form of artistic expression applied directly to walls. This art form has a recorded history that stretches back about 30,000 years to prehistoric times. During the Stone Age, early humans created paintings and drawings on the walls of caves that served as their living quarters. According to Merman et al., (2022), the earliest cave murals discovered were found in the Lascaux cave in southern France, emerging unexpectedly on September 12, 1940. These ancient artworks primarily depict various animals, showcasing the connection between early humans and their surroundings while also reflecting their cultural practices through visual storytelling.

Figure 1. Wall paintings in Lascaux Cave Southern France



(Source: Website thepatriots.asia, 2023)

The drawings found on the walls of the caves depict various animal images, including cattle, bison, and horses. These cave paintings serve as evidence that humans inhabited and thrived in these environments. In total, around 600 artworks cover the walls and ceilings, created using tools such as magnesium sticks and bird bones. Small groups of prehistoric people residing in Lascaux Cave produced these pieces, estimated to be approximately 17,000 years old. This site later became a tourist attraction starting on July 14, 1948. However, by 1955, the visibility of the paintings began to decline due to the impact of visitors, who introduced carbon dioxide, warmth, and humidity, leading to the degradation of these ancient artworks (Dans C'Kay, 2023).

Additional information indicates that an archaeological team from Griffith University in Australia has discovered another cave mural in the forests of Kalimantan, estimated to be between 30,000 and 50,000 years old. This cave painting originates from the Upper Palaeolithic period. Archaeological perspectives recognize many caves in East Kalimantan as containing ancient artworks. As noted by (Gloria Setynavi

Putri, 2018), this mural appears to depict a large, difficult-to-define animal. The illustration suggests that it resembles a wild cow roaming the Kalimantan Forest. Additionally, a handprint in the upper right corner of the mural adds to the mystery of these ancient art forms.

Figure 2. Wall Painting in Kalimantan Forest Cave



(Source: Website kompas.com, 2018)

According to Meiboudi et al., (2011) mural, derived from the Latin term ‘Murus,’ meaning wall, refers to a type of artwork often created in large, two-dimensional formats that adorn buildings or wall spaces. Techniques for mural painting encompass a variety of media, including oil paints, watercolors, and acrylics, as well as graffiti materials such as spray paint and markers. These artworks frequently employ traditional brushes, akin to calligraphy tools, along with aerosol colors and various other techniques. Typically, mural artists begin with preliminary sketches to plan the design and arrange a suitable composition before executing the actual mural. This preparatory stage is essential for achieving a balanced and impactful visual presentation.

Mural art often carries significant meanings related to social, historical, political, or cultural themes. This artistic form serves as a medium for expressing opinions, commemorating important events, and showcasing local identities. Additionally, murals enhance public spaces and inspire viewers in their vicinity. Accessible to a wide audience, these artworks present narratives connected to contemporary or past experiences (Azahar & Hussain, 2018). Murals can be found in diverse locations, ranging from urban buildings to remote rural areas. Beyond providing visual appeal, these works reflect the aesthetic experiences of muralists, contributing to a deeper understanding of the communities in which they are created.

Mural Paintings as a Medium of Information and Communication

From Since its development, mural painting has served not only as a form of art for aesthetic purposes but also as a medium for conveying social critiques, cultural expressions, patriotic sentiments, political turmoil, ideologies, and even advertising for specific products and brands (Sheehan Nababan, 2019). In George Town, Penang, murals honor notable football legends from the region. Portraits of late figures such as Datuk Namat Abdullah and others adorn the walls at the City Stadium, honoring Malaysian football players who are a source of pride for the community, especially in Penang. Furthermore, murals have also been utilized as platforms for public feedback, allowing communities to express their aspirations in combating the COVID-19 pandemic, which has affected the world since December 2019.

An example of mural painting can be seen at the Langkawi Geopark Discovery Centre in Kilim, created by three local artists: Fatah (FTH), Amir (Amer01), and Yus (FoxG). The National Art Gallery Branch of

Langkawi funded this large-scale project, which they completed in less than ten days. The mural's theme celebrates frontline workers, who serve as the primary defense against the spread of the virus (Hazrin, M. 2020). Additionally, this mural represents the first public artwork in Pulau Langkawi, responding to the increased awareness surrounding the COVID-19 pandemic.

This mural not only provides satisfaction for the artists and the involved organizations but also significantly impacts the local community, particularly for frontline workers regarded as the nation's heroes. Through a collaboration between the National Art Gallery and two local artists, Abdul Rashade Abdul Rahman and Dhiyaul Mohamad Asraf Dawariini, the mural depicts various activities of agencies responding to the COVID-19 pandemic under the leadership of Malaysia's Prime Minister, Tan Sri Muhyiddin Yassin, and the Director-General of Health, Tan Sri Dr. Noor Hisham Abdullah. As stated by Shahrudin, M. K. (2020), the phrase "we are strong together," prominently displayed on the mural, serves as motivation for the staff at the Kuala Lumpur Health Clinic, encouraging them to continue their dedicated service and efforts in battling the pandemic and facing future challenges.

Additionally, murals serve the purpose of visualizing images related to the heritage and history of local areas. An example can be found in George Town, Penang, recognized as a UNESCO World Heritage Site, where murals depict scenes of traditional food, activities, and the past lifestyles of its residents. George Town's narrow streets and heritage lanes showcase these artistic creations, drawing numerous tourists to Penang. Furthermore, these murals contribute to raising awareness among the local community about the historical significance of their city (Sadatiseyedmahalleh et al., 2015).

In general, it can be concluded that mural paintings play a significant role in enhancing the public's knowledge and providing visitors with historical information. These murals not only beautify walls and add aesthetic value but also introduce new attractions in the area. The use of such murals effectively promotes community spirit among residents. Moreover, these artworks can positively impact mental health and offer therapeutic benefits to those who come to view them. Therefore, the dissemination of information through murals should be maintained by relevant stakeholders, ensuring that the local community can interpret and understand the meaning behind each image displayed on the mural walls (Merman et al., 2022).

MATERIALS AND METHODS

Identification

In this study, we employed essential steps of the systematic review process to compile a significant body of relevant literature. The procedure began with identifying keywords, followed by exploring related terms using various resources such as dictionaries, thesauri, encyclopedias, and prior research. All pertinent terms were cataloged, and search strings were formulated for use in the Scopus and Web of Science (WoS) databases (see Table 1). This initial stage of the systematic review resulted in the identification of 951 publications relevant to the study topic across the three databases.

Table 1. The Search String

No	Sources	Keywords
1	Scopus	TITLE-ABS-KEY ((mural OR "wall art" OR "wall painting" OR "mural painting" OR "mural art" OR fresco OR "street art" OR "public art") AND (communicate* OR convey OR tell OR suggest*) AND (info* OR knowledge OR message OR news)) Date of Access: February 2025
2	Wos	(role OR function OR involve) AND ("mural art" OR "wall art" OR "art street" OR fresco OR mural) AND (economic OR profit OR financial) AND (grow* OR develop* OR progress) (All Fields) Date of Access: February 2025

The identification phase is a critical initial step in the systematic literature review (SLR) process, laying the foundation for subsequent analysis and synthesis of relevant research. In the context of our study, we employed the Scopus and Web of Science databases to systematically explore the literature associated with the keywords "mural art," "communications," and "information." These specific keywords were chosen to ensure that we captured a broad yet focused range of studies that explore the intersection of mural art with communication dynamics and information dissemination.

Upon conducting our search, we retrieved a total of 951 records from both databases. Within this total, we identified 425 records through the Scopus database. Scopus is known for its extensive coverage of peer-reviewed literature across various disciplines, and its robust search functionality allowed us to refine our query effectively. The search results from Scopus included a diverse array of journal articles, conference papers, and other scholarly works that examined various aspects of mural art's role as a communicative medium.

In addition, we identified 526 records through the WoS database. WoS is another leading resource for academic research, providing access to a wide range of high-impact journals and citation data. The records retrieved from WoS complemented those obtained from Scopus, as this database often includes different publications and interdisciplinary resources that enrich our understanding of the topic. The ability to cross-reference findings between these two databases also enhances the comprehensiveness of our literature review, ensuring that we capture a wide spectrum of scholarly perspectives on mural art, communication, and information.

The aggregation of these records highlights the significant interest and scholarly discourse surrounding mural art and its impact on communication and information. By leveraging both Scopus and Web of Science, we not only increased the quantity of relevant literature but also improved the quality and diversity of the sources included in our review. This comprehensive approach is instrumental in allowing us to identify key themes, methodologies, and findings in the existing body of work. The next steps in our systematic review will involve a thorough screening process to evaluate the relevance and quality of these records, ultimately facilitating a well-rounded analysis of the literature on mural art as a tool for communication and information dissemination.

Screening

During the screening phase, we assessed potentially relevant research items to confirm their alignment with our predefined research question(s). This crucial step involved selecting studies that specifically pertain to the impact of mural art on communication and information. At this stage, we also eliminated any duplicate papers to ensure a more accurate selection of literature. Based on various criteria, we excluded 664 publications from the initial pool, leaving us with 287 papers deemed suitable for further examination. This careful selection process is essential for maintaining the integrity of the review and ensuring the included research is both pertinent and relevant to our investigative aims, laying a solid foundation for the subsequent analysis.

Table 2. The Selection Criterion is Searching

No	Criterion	Inclusion	Exclusion
1	Language	English	Non-English
2	Timeline	English	Non-English
3	Literature Type	Journal (Article)	Conference, Book, Review
4	Publication Stage	Final	In Press

The main criterion for inclusion in the review was that the literature should serve as a primary source for practical recommendations (see Table 2). This included a variety of resources, such as reviews, meta-

syntheses, meta-analyses, books, book series, chapters, and conference proceedings that were not addressed in the most recent studies. Additionally, we restricted our review to English-language publications published between 2020 and 2025 to maintain consistency and relevancy in the findings. By focusing on these specific timeframes and types of literature, we enhance the quality and applicability of our review, ensuring that the research reflects the latest insights and developments in the field, thereby contributing valuable information to our understanding of mural art's impact.

Eligibility

In the third step, referred to as the eligibility phase, we prepared 235 articles for further review. During this critical stage, the titles and key content of each article were meticulously examined to determine whether they met the established inclusion criteria and aligned with the objectives of our current research. This thorough evaluation is essential for ensuring that the selected articles contribute meaningfully to the overall study. The process involved a close look at each piece to assess its relevancy in the context of mural art and its impacts on communication and information.

As a result of this rigorous assessment, we excluded 207 articles from consideration. Reasons for exclusion included being outside the relevant field, titles that did not significantly relate to our study's focus, abstracts that were not pertinent to our objectives, and lack of full-text access to empirically supported evidence. Following this process, we were left with a total of 28 articles that are suitable for the upcoming review, ensuring that the final selection provides a robust basis for our analysis of the impact of mural art on communication and information.

Data Abstraction and Analysis

An integrative analysis was employed as one of the assessment strategies in this study to explore and synthesize a wide range of research designs, particularly those utilizing quantitative methods. The primary objective of this comprehensive examination was to identify relevant topics and subtopics related to mural art and its impact on communication and information. The initial step in developing these themes was the data collection phase. As depicted in Figure 3 and Table 3, the authors carefully analyzed a selection of 28 publications, focusing on assertions or material pertinent to the current research topics. This meticulous scrutiny allowed for a deeper understanding of existing literature and its relevance to the study's objectives.

Subsequently, the authors evaluated significant existing studies concerning mural arts, examining the methodologies employed and the findings reported across the selected research. This evaluation was crucial for understanding the broader landscape of research on mural art. The authors then collaborated with co-authors to formulate themes that were grounded in the evidence gathered during the analysis. We maintained a detailed log throughout the data analysis process to document analyses, insights, questions, and any other thoughts pertinent to interpreting the data. This systematic approach ensured that all relevant information was captured and considered.

Finally, the authors compared results to identify any inconsistencies that may have arisen during the theme development process. It is essential to highlight that in cases of disagreement regarding conceptual interpretations, the authors engaged in discussions among themselves to seek clarification and alignment. This collaborative effort aimed to refine the thematic structure and ensure a cohesive understanding of the data, ultimately enhancing the quality and validity of the study's conclusions.

The themes generated from the analysis were subsequently refined to ensure coherence and consistency throughout the study. To validate the findings, a thorough assessment was conducted by two experts: Muhammad Salehuddin Zakaria, a specialist in mural arts and a lecturer in the Faculty of Fine Arts, and Nur Muhammad Amin Hashim Amir, an expert in visual communication, also from the Faculty of Fine Arts. Their expertise was instrumental in confirming the relevance and soundness of the identified issues. By

incorporating their insights, we aimed to enhance the rigor of the analysis and ensure that the themes reflect a comprehensive understanding of the research context.

The expert review phase played a crucial role in establishing the clarity, significance, and appropriateness of each subtheme. This process involved evaluating the themes against established criteria to confirm their domain validity. By doing so, we enhanced the overall quality of the thematic framework, ensuring that each subtheme was well-grounded in the evidence collected during the analysis. The collaboration with these experts not only strengthened the reliability of the findings but also ensured that the perspectives presented in the study were relevant and impactful, contributing meaningfully to the discourse surrounding mural art and its role in communication and information dissemination.

The authors compared their findings to address any discrepancies encountered during the theme creation process; they engaged in discussions to resolve any inconsistencies that emerged. This led to the refinement of the developed themes, ensuring their overall consistency. Two experts, one focused on legislation and the other on visual arts, carried out evaluations to validate the identified issues. This expert review phase was instrumental in ensuring the clarity, significance, and adequacy of each sub-theme, thereby confirming their domain validity. Adjustments were made at the authors' discretion, informed by the feedback and comments provided by the experts. Ultimately, the central research question guiding this study is how mural arts influence the dissemination of information and communication within communities.

Figure 3. Flow Diagram of the Proposed Search Study

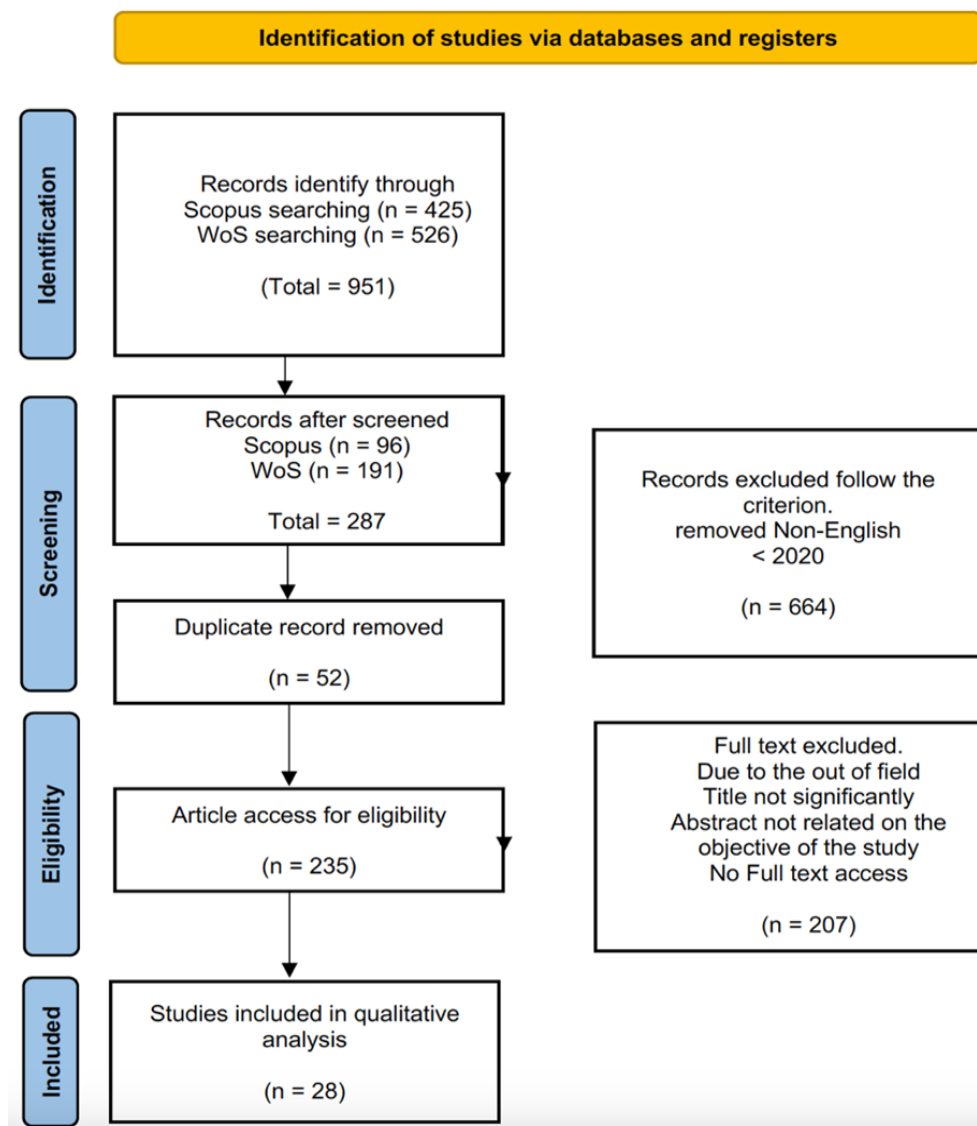


Table 3. Number and Details of Primary Study (PS) Data

No	Author	Title	Year	Source Title	Scopus	WoS
1	Qiao K.; Hou M.; Lyu S.; Li L. (K. Qiao et al., 2024)	Extraction and restoration of scratched murals based on hyperspectral imaging—a case study of murals in the East Wall of the sixth grotto of Yungang Grottoes, Datong, China	2024	Heritage Science	/	
2	Tomasini E.; Costantini I.; Careaga V.; Landa C.R.; Castro K.; Madariaga J.M.; Maier M.; Siracusano G. (Tomasini et al., 2023)	Identification of pigments and binders of a 17th century mural painting (Bolivia). New report on pigments associated with Andean minerals	2023	Journal of Cultural Heritage	/	/
3	Di Luggo A.; Zerlenga O. (Di Luggo & Zerlenga, 2020a)	Street art. Drawing on the walls	2020	Disegnarecon	/	
4	Fioretti G.; Garavelli A.; Germinario G.; Pinto D. (Fioretti et al., 2021)	Archaeometric study of wall rock paintings from the Sant'Angelo in Ciptis cave, Santeramo in Colle, Bari: insights on the rupestrian decorative art in Apulia (Southern Italy)	2021	Archaeological and Anthropological Sciences	/	
5	Lourenço M.I. (Lourenço, 2023)	Graphic design and public art: a comparative study in message communication; [Diseño gráfico y arte público: estudio comparativo de la comunicación de mensajes]	2023	Grafica	/	
6	Rivaroli L.; Moretti P.; Caricchio A.; Macchia A. (Rivaroli et al., 2021)	Mural art conservation data recording (Scima): The graart project	2021	Heritage	/	/
7	Mazreku F.; Rasimi A. (Mazreku & Rasimi, 2023)	Graffiti, street art, murals and music	2023	Street Art and Urban Creativity	/	
8	Barnes J. (Barnes, 2021)	'We are still here': The impacts of street music and street art during the 2020 London lockdowns	2021	International Journal of Community Music	/	
9	Schwartz K.L.; Gözl O. (Schwartz & Gözl, 2021a)	Visual propaganda at a crossroads: new techniques at Iran's Vali Asr billboard	2021	Visual Studies	/	
10	Gray M. (Gray, 2022)	The writing behind the wall: Text and image in late medieval church decoration	2022	Antiquaries Journal	/	/

11	Salvadori M.; Sbrolli C. (Salvadori & Sbrolli, 2021)	Wall paintings through the ages: the roman period—Republic and early Empire	2021	Archaeological and Anthropological Sciences	/	
12	Chatakul P.; Janpathompong S. (Chatakul & Janpathompong, 2022)	Identifying plant species and their usage for landscape on the historical mural paintings of Nan, Thailand	2022	Nakhara: Journal of Environmental Design and Planning	/	
13	Carden S. (Carden, 2017)	The use and social enjoyment of murals: 'The people's art,' its publics and cultural heritage	2017	Conservation, Tourism, and Identity of Contemporary Community Art: A Case Study of Felipe Seade's Mural "Allegory to Work"	/	
14	Bates B.R.; Grijalva D.A.; Jacho P.A.; Barriga-Abril C.X.; Grijalva M.J. (Bates et al., 2022)	Participatory mural painting and identifying resources in Asset Based Community Development research: a case in rural Ecuador	2022	Qualitative Research Reports in Communication	/	
15	Thompson B.; Jürgens A.-S.; Bohie; Lamberts R. (Thompson et al., 2023)	Street art as a vehicle for environmental science communication	2023	Journal of Science Communication	/	/
16	Medhavi D.; Trehan K. (Medhavi & Trehan, 2023)	Art for communicating crises: A semiotic analysis of COVID-19 murals	2023	Journal of Alternative and Community Media	/	
17	Armstrong M.A.; Rice C.A.G.; Warwick B. (Armstrong et al., 2024)	The visual communication of Brexit in Northern Ireland: decoding public imagery on identity, politics and Europe	2024	Territory, Politics, Governance	/	/
18	Sahabuddin W.; Hildayanti A. (Sahabuddin & Hildayanti, 2024)	Visual communication in public space through mural art in Makassar, Indonesia	2024	Sinergi (Indonesia)	/	
19	Song H.; Chen S.; Mustafa M. (Haiou et al., 2024)	Creativity, Practical Ability, Self-Identity: Public Art Practice with Primary School Students in China	2025	International Journal of Art and Design Education	/	/
20	Du B.-H. (Du, 2024)	Exploration of Mural Creation in Eastern Zhejiang Art Mural Villages	2024	Communications in Computer and Information Science	/	
21	Kar N.; Huang C.; Sridhar S.; Edwards M.E.; Ghosh S.; Nikolov M.E.; Paranzino B.; Yan X.; Willets K.A.; Ye X.; Skrabalak S.E. (Kar et al., 2024)	Magnifying Minds: Exploring the Concepts of Size and Scale with a Public Mural and Integrated Activities	2024	Journal of Chemical Education	/	
22	Polson E.	Street art in the Insta-city:	2025	International	/	/

	(Polson, 2025)	Mobile audiences and urban placemaking		Communication Gazette		
23	Guzmán, F; Corti, P; Pereira, M (Guzmán et al., 2023)	The puma and the snake. Interpretation of the mural painting of the Church of Parinacota, Northern Chile	2023	Boletin Del Museo Chileno De Arte Precolombino		/
24	Reisch, ME (Reisch, 2021)	sinne and selen kraft: medieval models of sensory perception in a mural of the Constance Haus zur Kunkel	2021	Postmedieval-A Journal Of Medieval Cultural Studies		/
25	Schwartz, KL; Gözl, O (Schwartz & Gözl, 2021b)	Visual propaganda at a crossroads: new techniques at Iran's Vali Asr billboard	2021	Visual Studies		/
26	Perzycka-Borowska, E; Gliniecka, M; Kukielko, K; Parchimowicz, M (Perzycka-Borowska et al., 2023)	Socio-Educational Impact of Ukraine War Murals: Jasien Railway Station Gallery	2023	Arts		/
27	Perzycka-Borowska, E; Gliniecka, M; Hrycak-Krzyzanowska, D; Szajner, A (Perzycka-Borowska et al., 2024)	Murals and Graffiti in Ruins: What Does the Art from the Aliko Hotel on Naxos Tell Us?	2024	Arts		/
28	Qiao, KZ; Hou, ML; Lyu, SQ; Li, LH (K. Z. Qiao et al., 2024)	Extraction and restoration of scratched murals based on hyperspectral imaging-a case study of murals in the East Wall of the sixth grotto of Yungang Grottoes, Datong, China	2024	Heritage Science		/

RESULT AND FINDING

Mural Art Conservation and Restoration

The conservation and restoration of mural art have become increasingly essential in response to the various threats posed to cultural heritage. Innovative techniques have developed methodologies for accurately restoring murals as awareness of the need to protect these cultural relics grows. For instance, Qiao, K. et al., (2024) present a study using hyperspectral imaging to address the challenge of restoring scratched murals located in the Yungang Grottoes, a site of significant historical importance in China. Their research emphasizes the necessity of precise deterioration extraction, specifically highlighting methods such as Principal Component Analysis (PCA) and high-pass filtering. The authors said that using multi-scale bottom hat transformations and Otsu threshold segmentation along with connected component analysis made it easier to find and extract deterioration markings. This innovative approach not only enhances the effectiveness of conservation efforts but also underscores the importance of technological integration in the preservation of mural art.

Alongside technological advancements in mural restoration, the identification of materials used in historical murals provides crucial insights that inform conservation practices. As stated by Tomasini et al., (2023), an interdisciplinary investigation on a 17th-century mural painting in Bolivia was conducted, uncovering the

artistic techniques and materials employed by Andean painters. Utilizing advanced analytical methods such as scanning electron microscopy with energy dispersive X-ray spectroscopy (SEM-EDS) and Raman micro-spectroscopy allowed for a comprehensive understanding of the pigments and binders used in the painting. The discovery of a green pigment derived from a mixture of atacamite and antlerite is particularly noteworthy as it demonstrates the historical continuity of local material use, bridging pre-Hispanic and colonial artistic practices. This investigation illustrates the intertwining of art conservation with historical research, providing valuable contextual knowledge that can enhance current preservation methodologies.

The compilation of data regarding the condition and conservation needs of mural art is critical for implementing effective preservation strategies. As indicated by Rivaroli et al., (2021), they introduce the Scheda Conservativa Informatizzata Mural Art (SCIMA) project, which aims to systematically document the state of urban mural art in Italy. The SCIMA tool serves as a digitized conservation data report that records varying murals' conditions, encompassing essential factors such as historical importance, environmental factors, and material specifications. By focusing on these elements, the project contributes to a broader understanding of conservation practices within urban art, emphasizing that careful documentation serves as a foundational step for long-term preservation. As urban art continues to evolve and transform public spaces, frameworks like SCIMA are vital for ensuring that these artworks are adequately preserved for future generations.

Furthermore, it is crucial to combine conservation knowledge with effective communication pathways. As murals often engage with various cultural, political, and societal narratives, understanding the context in which these artworks exist significantly enhances conservation efforts. For instance, preserving the structural integrity of murals while maintaining their information and narrative functions is essential for conveying their intended messages. The critical interplay between accurate restoration and the aesthetic representation of murals thereby reinforces the necessity to balance technical advancements with artistic integrity. Such interdisciplinary considerations highlight that mural conservation is not only a technical discipline but also an avenue for safeguarding collective memory.

In conclusion, the conservation and restoration of mural art encompass a range of methodologies, interdisciplinary approaches, and technological innovations. Studies such as those elucidate how advancements in imaging techniques, material identification, and systematic data documentation contribute to the field's evolution. Collaboration between conservation scientists, art historians, and urban planners fosters the development of effective preservation strategies, ensuring the long-lasting integrity of murals. These interconnections emphasize the broader significance of mural art within cultural heritage preservation, as they embody the intersection of historical narrative, artistic expression, and community engagement.

Mural Art as a Medium for Communication

Mural art has emerged as a significant medium for communication, functioning as a powerful vehicle for expressing social narratives, promoting environmental awareness, and fostering community cohesion. The historical evolution of street art reveals its roots in the socio-political climate of marginalized neighborhoods, where graffiti evolved from a form of rebellion to an instrument of urban regeneration. The transformation of street art, initially branded illegal and vandalism, into a recognized cultural asset emphasizes its role as a catalyst for social change and community empowerment. history reflects a broader trend wherein public art, through its accessible nature, transcends barriers and contributes to various discourses on identity, politics, and urban transformation (Di Luggo & Zerlenga, 2020b).

Researchers have further analyzed the communicative power of mural art within the context of graphic design and public art. In the view of Lourenço, (2023) exploring the intersectionality between these fields and revealing that both graphic design and public art serve distinct yet overlapping purposes in message dissemination. Public art can engage in dialogue with the community by conveying important social messages, while graphic design often focuses on commercial objectives. The effectiveness of these mediums lies in their ability to resonate with diverse audiences, as noted in the comparative study, illustrating their critical role in shaping public perceptions and enhancing community engagement.

Murals also play a pivotal role in educational contexts and community identity. For instance, (Mazreku & Rasimi, 2023) analyze murals created by school students in Kosovo that reflect their experiences and aspirations. These creative endeavors not only serve as artistic expressions but also as educational tools, where messages related to social issues and personal empowerment are prominently featured. Such murals resonate with the youth, reinforcing their sense of identity and community involvement. The interplay between street art and educational themes highlights how visual art can bridge gaps between generations and foster community connection.

In the realm of environmental communication, street art emerges as a creative grassroots approach to address pressing ecological issues. Thompson et al. (2023) highlight the potential of environmental street art to engage the public in sustainability initiatives, using visually stimulating murals to convey complex scientific messages effectively. By transforming public spaces into canvases for environmental advocacy, artists contribute to raising awareness and prompting community action. The findings suggest that street art can serve not merely as artistic decor but as a meaningful conduit for environmental education and activism, reinforcing the role of artists as change-makers in contemporary society (Medhavi & Trehan, 2023; Thompson et al., 2023).

The effects of mural art extend beyond individual expression to foster a sense of belonging within communities. During the COVID-19 pandemic, street art initiatives emerged in response to the crisis, as discussed by Barnes, (2021). Informal street music and art projects facilitated connections among residents, enhancing feelings of local cohesion during challenging times. Such initiatives demonstrate how public art functions as a therapeutic outlet, providing solace and unifying communities in the face of adversity. The ability of murals to adapt and respond to the zeitgeist exemplifies their ongoing relevance in fostering social resilience (Bates et al., 2022; Carden, 2017).

Additionally, the semiotic analysis of COVID-19 murals in New Delhi offers insights into how street art serves as a crucial communication tool in times of crisis. They reveal that these murals not only disseminate health-related information but also reflect cultural values and community dynamics. The collaborative nature of mural creation ensures that the messages conveyed resonate with the local population, effectively bridging the gap between public health initiatives and community engagement. This case underscores the multifaceted utility of murals as not just aesthetic expressions but also vital components of crisis communication.

In conclusion, mural art serves a multifaceted role in contemporary society as a medium for communication that encapsulates social commentary, environmental advocacy, and community engagement. The collective research emphasizes that murals are not mere decorations but rather vital communicative resources that reflect and shape public discourse. By connecting diverse audiences with various messages, from social cohesion to environmental awareness, murals facilitate a rich dialogue that fosters community identity and resilience. As public art continues to evolve, its significance as a tool for communication and social transformation remains profound.

Cultural Perspectives and Historical Contexts of Mural Art

The cultural significance and historical context surrounding mural art reveal rich narratives that encompass both local practices and broader societal values. As explored by (Fioretti et al., 2021), the archaeological study of wall paintings in Southern Italy highlights the intricate skills employed by artisans in the creation of murals dedicated to religious figures. The careful analysis of mortars and pigments not only provides insight into the technical knowledge of the artists but also helps contextualize the cultural practices of the time. By utilizing methods such as micro-Raman spectroscopy and scanning electron microscopy, the researchers identified a range of pigments, including red and yellow ochres and carbon black, which were skillfully mixed to achieve a variety of hues. This technical expertise reflects the cultural significance of mural art during the medieval period in Apulia, indicating that these artworks were not merely decorative but served as profound representations of the era's spiritual and cultural narratives (Gray, 2022; Salvadori & Sbrolli, 2021).

In understanding the interplay between text and imagery, they highlight the complex relationship between wall paintings from medieval churches. The use of textual elements alongside visual depictions enriched the storytelling aspect of murals, demonstrating how public art can engage with communal knowledge and reflections on faith. Visual representation of the ecclesiastical teachings facilitates a dynamic interaction, making these concepts more accessible to the congregation. Such interactions showcase how murals can function as pivotal educational tools, bridging the gap between sacred texts and everyday understanding. By studying the convergence of message and medium in this context, it is possible to discern how mural art serves not only as an aesthetic element but also as a vital component of religious education and community engagement.

Moving beyond the European context, the research conducted by Chatakul & Janpathompong, (2022) on murals in Thailand provides another layer of understanding. Their examination of the historical murals in Phumin and Nongbua temples uncovers a wealth of agricultural and ecological knowledge embedded within the artworks. By identifying and cataloging the plant species portrayed, this study explores how murals serve as visual archives of the region's natural heritage and traditional practices. Understanding how art communicates local identity and ecological awareness, reflecting the interdependence of culture and environment, relies heavily on these representations. The findings from this research suggest that murals are not only artistic expressions but also significant cultural documents that illuminate past practices, support contemporary landscape design, and preserve local identity (Carden, 2017).

The investigation of mural art's cultural resonance continues in the context of community identity and socio-political narratives. Guzmán et al., (2023) emphasize the role of murals in the Church of Parinacota, revealing insights into the community's conversion experience to Christianity. The coexistence of Christian and indigenous iconographies suggests a complex layering of cultural beliefs where traditional and spiritual practices intersect. This dynamic representation invites deeper exploration of how communities adapt and reinterpret their cultural identities in the face of changing religious landscapes. The murals serve as visual narratives that reflect ongoing negotiations between indigenous heritage and colonial influences, providing a critical commentary on the historical context of cultural identity and social empowerment.

Furthermore, the research conducted by (Perzycka-Borowska et al., 2023) on the socio-educational impact of murals related to the Ukraine war illustrates how public art can serve as a medium for political commentary and civic engagement. By analyzing 32 murals at Jasien Railway Station in Poland, this study identifies themes that resonate with the public regarding conflict, memory, and resilience. Through the lens of visual communication, these murals not only evoke emotional responses but also facilitate dialogue around pressing socio-political issues. The classification of mural themes, such as "resistance and hope," underscores the powerful role of art in shaping public perception and fostering community solidarity during times of crisis. Such findings highlight an essential aspect of murals as mechanisms for cultural expression and social reflection.

Lastly, the examination of murals from the Aliko Hotel on Naxos Island draws attention to the ephemeral nature of street art and its capacity to convey complex socio-cultural narratives. This study employs semiotic analysis to interpret both the overt and subtle messages contained within the artworks, illustrating how personal and collective identities are represented and negotiated through visual forms. The transient character of these murals serves as a poignant reminder of the fleeting nature of cultural heritage, urging the need for documentation and preservation efforts. This study reinforces the idea that murals act as dynamic sites of cultural discourse, highlighting their potential to enhance community identity.

CONCLUSION

The conservation and restoration of mural art have become increasingly vital due to ongoing threats to cultural heritage. Growing awareness of the need to protect these artworks has led to the development of innovative methodologies that enhance restoration processes. Techniques such as hyperspectral imaging and material analyses through scanning electron microscopy provide critical insights into the composition and

deterioration of historical murals. These advancements emphasize the necessity of integrating modern technology with traditional artistic practices, offering a deeper understanding of the cultural contexts surrounding these artworks.

Systematic documentation efforts, like the SCIMA project, play an essential role in gathering data on urban mural conditions, enabling the formulation of effective preservation strategies that account for environmental and historical factors. As mural art conveys complex narratives related to societal and political themes, preserving their physical integrity while maintaining these messages is crucial. This dynamic interplay illustrates that successful conservation requires an interdisciplinary approach, merging expertise from diverse fields. By fostering collaboration among conservation scientists, art historians, and community stakeholders, it is possible to establish comprehensive strategies that not only ensure the longevity of murals but also enrich public engagement and appreciation for these significant cultural expressions. Ultimately, a holistic understanding of mural art enhances both its preservation and its role in contemporary society.

Mural art has established itself as a dynamic medium for communication, effectively addressing social issues, environmental concerns, and community engagement. Historically rooted in marginalized neighborhoods, graffiti transformed from a form of rebellion into an essential instrument for urban regeneration, demonstrating its capacity to inspire social change and empower local communities. By engaging with diverse audiences, mural art fosters meaningful dialogue, reinforcing public perceptions and enhancing community identity through its accessible nature. Furthermore, murals function as educational tools, particularly among youth, by conveying messages that resonate with their experiences and aspirations.

In the context of environmental advocacy, street art has emerged as a creative approach to engage the public in sustainability efforts, turning public spaces into platforms for ecological education. During crises such as the COVID-19 pandemic, murals also played a critical role in unifying communities, providing solace, and fostering connectedness. The collaborative process behind these artworks ensures that the messages reflect community values while effectively linking public health initiatives to local dynamics. Ultimately, the impact of mural art extends beyond aesthetic appreciation, serving as a vital resource for communication that promotes resilience, identity, and social transformation within society. Its evolving significance highlights the central role of public art in shaping cultural narratives and fostering an engaged community.

The exploration of mural art reveals its profound cultural significance and rich historical context, showcasing how these artworks serve as vital communicative tools within communities. Through detailed analyses of techniques and materials, murals provide insights into the artistic practices and societal values of various eras, whether in showcasing religious iconography or reflecting indigenous and spiritual intertwined beliefs. Additionally, murals capture ecological knowledge and agricultural practices, functioning as visual archives that preserve local identities and heritage. The complexity of murals is further demonstrated through their role in articulating socio-political narratives, as evidenced by contemporary murals addressing themes of conflict and community resilience. Such artworks not only express emotional responses but also facilitate public dialogue on pressing issues, reinforcing a sense of solidarity among viewers.

Furthermore, the ephemeral nature of some murals accentuates the urgency of documentation and preservation, ensuring that these dynamic cultural expressions continue to resonate with future generations. Overall, mural art emerges as a multifaceted medium, bridging past practices with contemporary concerns, thereby enriching community identity and fostering discussion on broader social and environmental themes. Its capacity to encapsulate the essence of cultural narratives underlines the essential role murals play in shaping and reflecting the human experience within specific historical and socio-political contexts.

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