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Museum Sensorium: Redefining the aesthetic experience in museums through sensory elements and advanced technology

Sensorium museístico: Redefiniendo la experiencia estética en museos a través de elementos sensoriales y tecnología avanzada

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ABSTRACT

The aesthetic experience of visitors in museums is a complex facet, influenced by a variety of sensory elements. Understanding how these elements affect the perception and enjoyment of art and culture is essential for exhibition design and museum management. This review aims to collect, analyze and synthesize existing research on the influence of aspects such as touch, sight, sound and the use of advanced technologies on the museum experience, in order to understand how they can be integrated effectively to enrich this experience. An exhaustive bibliographic review was carried out, covering studies from the year 2000 to the present. The methodology included the synthesis of research from various disciplines, focusing on studies that examine the influence of sensory and technological elements on the experience of museum visitors. The studies reviewed reveal that signage, wayfinding, inclusivity, architecture, and multisensory experiences, including the use of augmented and virtual reality, have a significant impact on the visitor experience. Effectively integrating these elements can create richer, more inclusive and memorable experiences. To enrich the museum experience, it is essential to consider a variety of sensory and technological elements. The research suggests the need for more interdisciplinary approaches and controlled experiments for a deeper understanding of these influences.

Keywords: Aesthetic experience, museums, sensory elements, augmented reality, virtual reality, inclusion, exhibition design.

RESUMEN

La experiencia estética de los visitantes en museos es una faceta compleja, influenciada por una variedad de elementos sensoriales. Entender cómo estos elementos inciden en la percepción y disfrute del arte y la cultura es fundamental para el diseño de exposiciones y la gestión de museos. Esta revisión tiene como objetivo recopilar, analizar y sintetizar investigaciones existentes sobre la influencia de aspectos como el tacto, la vista, el sonido y el uso de tecnologías avanzadas en la experiencia museística, con el fin de entender cómo se pueden integrar de manera efectiva para enriquecer esta experiencia. Se realizó una revisión bibliográfica exhaustiva, abarcando estudios desde el año 2000 hasta la actualidad. La metodología incluyó la síntesis de investigaciones de diversas disciplinas, enfocándose en estudios que examinan la influencia de elementos sensoriales y tecnológicos en la experiencia de los visitantes de museos. Los estudios revisados revelan que la señalización, la orientación, la inclusión, la arquitectura, y las experiencias multisensoriales, incluyendo el uso de realidad aumentada y virtual, tienen un impacto significativo en la experiencia de los visitantes. La integración eficaz de estos elementos puede crear experiencias más ricas, inclusivas y memorables. Para enriquecer la experiencia en los museos, es esencial considerar una variedad de elementos sensoriales y tecnológicos. La investigación sugiere la necesidad de enfoques más interdisciplinarios y experimentos controlados para una comprensión más profunda de estas influencias.

Palabras clave: Experiencia estética, museos, elementos sensoriales, realidad aumentada, realidad virtual, inclusión, diseño de exposiciones.

INTRODUCTION

In the contemporary era, museums have transcended their traditional roles as mere repositories of art and historical artifacts, evolving into dynamic spaces that offer rich, multi-sensory experiences. This transformation is fueled by technological advancements and an increasing emphasis on accessibility and inclusion, leading to museum experiences that engage visitors through a variety of sensory elements such as lighting, sound, texture, and interactivity. Despite the growing recognition of the importance of these sensory experiences, a comprehensive understanding of how these elements collectively influence the perception and appreciation of artworks and exhibits remains elusive.

Addressing this gap calls for a deeper, more holistic exploration. To date, research in this field has been varied and fragmented, often examining sensory elements in isolation. This piecemeal approach has resulted in a limited understanding of how these elements interact and contribute to the overall visitor experience—a central question that drives our research.

The guiding question for this literature review is: How do different sensory elements impact the aesthetic experience of museum visitors, and how can they be effectively integrated to enrich this experience? Our objective is to collect, analyze, and synthesize existing research to understand how elements such as touch, sight, sound, and advanced technologies like augmented and virtual reality converge to shape the perception and enjoyment of art and culture within a museum setting.

This review seeks to provide a comprehensive understanding that can inform future research and practices in exhibition design and museum management. Our focus is on how to create richer, more inclusive, and memorable experiences for visitors, thereby contributing to the ongoing evolution of museums as dynamic spaces

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that are responsive to the changing needs of their audiences.

METHODS

To conduct this literature review on the impact of sensory aspects on the aesthetic experience of museum visitors, a systematic and rigorous approach was adopted. The methodology focused on the collection, analysis, and synthesis of a wide range of relevant studies and research spanning from 2000 to 2022. This timeframe was selected to encompass both pioneering research and the most recent advancements in the field.

An extensive literature search was initially conducted across several academic and scientific databases, including JSTOR, ScienceDirect, and Google Scholar. Keywords and phrases such as "sensory experience in museums," "tactile perception in art exhibitions," "interactive technologies in museums," and "augmented reality and museum experience," among others, were used. This search was further supplemented by a review of the references cited in the identified studies, allowing for the discovery of additional relevant works.

Clear inclusion and exclusion criteria were established to guide the selection of studies. Included were studies specifically focused on sensory experiences within the museum context and those exploring the integration of interactive and multisensory technologies in museums. Excluded were studies that, while related to art and culture, did not directly address the sensory experience in museums or focused solely on historical or curatorial aspects without considering the visitor experience.

Once the studies were collected, they were critically analyzed. The research methods, populations studied, key findings, and conclusions drawn by the researchers were meticulously examined. This analysis facilitated the identification of patterns, trends, and gaps in the existing research.

For the synthesis of information, a thematic approach was adopted, grouping studies according to the different sensory aspects examined (such as touch, sight, and sound) and the technologies employed (such as augmented and virtual reality). This thematic organization enabled an effective comparison and contrast of the various studies, providing a clearer understanding of how each sensory element contributes to the aesthetic experience in museums.

BIBLIOGRAPHIC REVIEW

Proposals for integrating the senses in the configuration of the interior spaces of museums

This literature review explores how museums and art galleries have increasingly adopted multi-sensory approaches to enhance the visitor experience. The proposals and case studies analyzed emphasize the integration of various senses in the design and configuration of museum interiors. The studies have been thematically grouped to highlight the similarities in their approaches and findings.

Several studies have investigated the incorporation of advanced technologies and interactive experiences in museums. Carrozzino and Bergamasco (2010) emphasized the potential of immersive virtual reality in mediating the museum experience. Bertrand et al. (2021) furthered this research by proposing the application of Mixed Reality technologies to expand access to cultural heritage. Similarly, McCarthy and Ciolfi (2008) and Trunfio et al. (2022) examined multisensory experiences at the Hunt Museum in Limerick, Ireland, and the Pacis Museum in Rome, respectively, where physical and digital artifacts were combined to enrich visitor engagement.

The integration of specific sensory experiences has been a central theme in numerous studies. Henshaw (2013) and Camacho (2019) incorporated tactile, auditory, and olfactory elements into their exhibits at the Neues Museum in Berlin and the Can Tinturé Museum, respectively, creating immersive and educational experiences. Meanwhile, Pueo and Sánchez (2013) suggested using audiovisual screens in museums and cultural centers to deepen the immersive experience for visitors.

Capece and Chivăran (2020) conducted a critical review of transformations in museographic design, highlighting the importance of narrative methods and interactive, sensory, and engaging experiences. This perspective is complemented by the work of Gladstone (2012) and Muñoz and Rodríguez (2015), who emphasized the importance of active visitor participation in shaping exhibitions and interacting with contemporary art.

Papadimitriou et al. (2016) addressed conceptual barriers in current museological practices and proposed strategies to overcome these limitations, transforming museums into more inclusive and accessible public spaces. Similarly, Cameron et al. (2013) presented proposals analyzing how climate change challenges traditional museum concepts and practices.

The influence of sensory experiences on visitor perception has also been a significant focus. Morales (2015), with his proposal "Opposites Touch Each Other," and Santillán (2021), with "Preparation of Pachamanka," explored how tactile and gustatory experiences can stimulate creativity and engage other senses. Voegelin (2014) introduced the concept of the "Sound Walk" in museums, grounded in acoustic ecology and soundscape design.

Collectively, these studies reflect a growing trend toward utilizing multi-sensory experiences in museums, underscoring the importance of integrating diverse sensory elements to enrich the visitor experience. From advanced technology integration to exploring specific sensory experiences, the reviewed proposals highlight the need for a comprehensive strategy that considers all aspects of the sensory experience in museum design and management.

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Table 1

Proposals for integrating senses in museum experiences

Proposal Name	Year	Location	Description
Lighting proposal	2017	Edmundo Martínez Museum / Ambato	Lighting comfort for visitors and greater sensory experimentation.
The Process Lab	2018	Smithsonian Design Museum	Interactive device that allows acting as a sound designer.
Soundwalk	2014	Not specified	Intentional audios.
Dam Square soundscape	2014	Amsterdam Museum	Comparing recent recording of the Dam Square soundscape with simulations.
Opposites collide	2015	Neuro-rehabilitation clinic	Sensory design aimed at tactile and haptic perception.
Pachamanka preparation	2021	Otavalango Museum.	Ancestral Andean cooking technique.
The five senses and art	1997	Prado Museum	Illustrations of books, everyday objects, scientific and musical tools from the 16th and 17th centuries.
Goulding project	2000	Birmingham Museum	Audiovisual screens, computer games and VR constructions.
Museum renovation	2006	Badalona Museum.	Characteristic sounds of a Roman city.
Re-Tracing the Past interactive exhibition	2008	Hunt Museum in Limerick, Ireland.	Hybrid, physical and digital artifacts.
Explore Guernica	2008	Museo Nacional Centro de Arte Reina Sofía.	Combination of verbal data, integration of tactile diagrams and the execution of creative workshops.
Interactive thematic museum design for children	2010	Not specified	Game-learning process that relates to each of the senses.
The silence of the idols	2013	National Museum of Colombia.	Displacement of canonical representation of statuary objects.
Playful and navigational product	2013	Interactive Science Museum (MIC), Chimbacalle-Quito.	Use of elements of the exhibition
Hybrid method	2013	Neues Museum, Berlin, Germany	Improved understanding of the relationship between humans and sensory urban space.
Feelings. Feeling the tiles	2015	Can Tinturé Museum	Multisensory experiments with raw material tiles
Tate Sensorium	2015	Tate Britain	Addition of sounds, taste, touch, smell and olfaction.
Sensory activity aimed at visually impaired people	2018	Gaudí Centre / Tarragona	Multisensory experience of models and materials used by Gaudí
Multisensory transformation matrix	2018	Not specified	Portable form that fits in the visitor's hand
Interpretive and Sensory Museum	2019	La Candelaria, Bogotá.	Experimental sequence related to sensory organs.
Multisensory project / Snoezelen method	2019	Heritage site in Cuenca	Interpretation center that allows the creation of straw hats.
Multisensory exhibition	2019	Gwacheon National Science Museum, South Korea	Visual, auditory and vibrotactile stimuli.
People by the seaside	2020	Taizhou Museum	Experience based on multiple senses.
The Ara It Was	2022	Pacis Museum, Rome.	VR and AR to create immersive and multisensory scenarios.
Augmented reality implementation	2021	Eliécer Silva Celis Museum	Application of Genially software, which integrates augmented reality.

The impact of sensorial aspects on the aesthetic experience of museum visitors

The following literature review examines the impact of sensory aspects on the aesthetic experience of museum visitors. The studies are grouped according to the sensory and thematic dimensions explored, emphasizing the diversity and complexity of factors that influence perception and experience in cultural spaces.

In 2000, Goulding highlighted the importance of information in orienting visitors, demonstrating how its absence at the Birmingham Museum and Art Gallery led to disorientation. Though based on personal experience, this study underscores the need for clear signage and orientation to enhance the visitor experience.

Joy and Sherry (2003) explored the relationship between bodily experience and art appreciation in museums, emphasizing how the body influences abstract thinking. Their study reveals that the museum experience is inherently multisensory, extending beyond mere visual observation.

In 2008, González D'Ambrosio evaluated the educational program "Explore Guernica," finding that verbal explanations and tactile diagrams significantly improved the aesthetic experience for visually impaired visitors. This finding underscores the importance of inclusive tools in exhibition design.

Jeong and Lee (2006) focused on the impact of the physical environment on visitor satisfaction in museums in and around Seoul. They identified factors such as visitor density, noise, and thermal comfort, although their effects on overall satisfaction were indirect and not strongly pronounced.

Henshaw and Mould (2013) used a sensory design tool to evaluate the sensory qualities of the

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Neues Museum in Berlin. Their findings on the variation of sounds and smells in different parts of the museum indicate how these elements can influence the visitor experience, though the study acknowledges limitations in the scope and diversity of spaces examined.

Afanador (2014) investigated the impact of the "The Silence of the Idols" project at the National Museum of Colombia but found no clear correlations linking the incorporation of sensory elements with visitor satisfaction.

Cirrincione et al. (2014) analyzed the impact of ambient odors on art perception and memory. This intriguing study found that while scents can enhance the experience, they can also have contradictory effects on the evaluation and recall of artworks.

Meyers-Levy and Zhu (2007) and Benavides and Vera (2015) investigated how architectural features such as ceiling height and spatial perception influence the visitor experience. These studies suggest that architectural variations not only affect aesthetic judgments but also elicit specific emotional and cognitive responses.

Morales (2015), in his research "Sensory Design Targeting Tactile and Haptic Perception 'Opposites Collide'," applied a novel approach by focusing on tactile interaction with artworks. Despite the limited study population, this approach highlights the importance of physical interaction in creating memorable museum experiences.

Mangione (2016) conducted an ethnographic study in an art museum and a botanical garden to examine how sensory conventions vary between these spaces. This study is significant as it illustrates how museum staff can influence the way visitors engage their senses during visits.

Núñez (2017) designed a lighting proposal for the Museo Edmundo Martínez de Ambato and, through a questionnaire, revealed that only a minority of visitors perceived a different sensation compared to other museums. This study highlights the complexity of assessing the influence of lighting on the museum experience.

Baccaglini (2018) described a personal experience at the Cooper Hewitt, Smithsonian Design Museum, where the combination of sound and sight created a unique experience. Although based on individual experience, this study illustrates how the integration of different senses can enrich the museum experience.

Bazán et al. (2018) investigated the relationship between lighting and visitor satisfaction in two museums in Argentina. While they could not establish a direct correlation, their findings suggest varied perceptions of lighting and its impact on the museum experience.

Sharif-Askari and Abu-Hijleh (2018) focused on the quality of the indoor environment in museums, emphasizing the importance of parameters such as temperature, humidity, lighting, and air quality. This study is crucial for understanding how these factors influence both the preservation of artifacts and visitor comfort.

Studies on natural light by Al-Sallal and Bin Dalmouk (2011) and Kim and Chung (2011) highlight the importance of incorporating natural light in a way that benefits both visitors and the preservation of artifacts.

Christidou and Pierroux (2019) emphasized the importance of touch in interpreting modern sculptures, offering an innovative perspective that complements visual information. Their approach highlights the value of incorporating tactile experiences in exhibitions to enrich art interpretation and understanding.

Camacho (2019) explored the sensory experience with blind adults at the Can Tinturé Museum, underscoring the importance of inclusivity in museum activities and how these can be enriching and accessible to all visitors, regardless of sensory abilities.

Jung et al. (2019) demonstrated that vibro-tactile and auditory stimulation can significantly enhance the museum experience, although further research with larger samples is needed to generalize these findings.

Everrett (2019) investigated how integrating auditory and visual elements into exhibitions can enhance the visitor experience, suggesting that a combination of sensory stimuli may be more effective in creating memorable experiences.

Papathanasiou-Zuhrt et al. (2019) addressed the role of new technologies in the cultural heritage experience, emphasizing the importance of fostering interactive learning experiences and democratizing access to heritage.

Nechita and Rezeanu (2019) highlighted the educational benefits of Augmented Reality in museums, underscoring the technology's potential to engage new audiences and enhance educational experiences.

Ducros and Euzéby (2020) and Wang (2020) explored immersive experiences in museums, pointing out the importance of combining multiple sensory approaches to achieve deeper and more memorable effects.

Zhao (2020) examined how natural light affects visitors' perception, stressing the importance of architectural design that integrates natural light to enhance the museum experience.

Infantes et al. (2020) and Santillán (2021) investigated how specific sensory experiences, such as sensory stimulation in a wine museum and traditional dish tastings, can enrich the visitor experience.

Roa (2021) and Trunfio et al. (2022) examined the impact of augmented and virtual reality in museums, highlighting their potential to enhance and immerse visitors in the experience.

Sihvonen and Turunen (2022) and Genc and Gulertekin (2022) focused on how sensory stimuli at travel fairs and cultural heritage sites can evoke emotional responses and affect visitor satisfaction.

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Table 2

Summary of studies that have evaluated the sensorial aspect of the aesthetic experience of museum visitors

Authors	Proposals	Techniques	Findings	Limitations
Goulding (2000)	Birmingham Museum and Art Gallery.	Observation of on-site behavior	Physical and mental disorientation	Personal experience. Impressions cannot be generalized
González D'Ambrosio (2008)	Programa educativo "Explora Guernica"	Questionnaire applied to 37 visually impaired people	Verbal explanation and exploration of tactile diagrams contribute to aesthetic experience	Research focuses exclusively on general visitor satisfaction
Henshaw y Mould (2013)	Neues Museum, Berlín, Alemania	Sensory design tool to evaluate sensory qualities of the museum	In meeting, circulation and café/restaurant spaces, noise levels increased	Low number of participants
Afanador (2014)	El silencio de los ídolos	Interviews with visitors, administrative staff and experts	60% felt that information provided was easy to understand	No correlation between incorporation of sensory elements and satisfaction
Cirrincione et al. (2014)	Impact of environmental odor on art perception	86 participants evaluated works while they were in an environment where two aromas were diffused	Enhancing experiences through sensory cues hinders evaluation and memory of art	Not reported
Morales (2015)	Sensory design: "Los opuestos se topan"	Application of a questionnaire to 50 perceivers of the exhibition	68% recalled individual experience, 80% felt it provoked an emotion	The small population with which we worked prevents making generalizations
Mangione (2016)	Programs for people with disabilities	Ethnographic study with museum staff and visitors	Aesthetic practices of museums facilitate perception and interaction	Not reported
Núñez (2017)	Lighting proposal Ambato Museum	Application of a questionnaire to 100 visitors, between 18 and 50 years of age	12% of visitors perceived a different sensation than other museums visited	No revealing inferences are established.
Baccaglini (2018)	"The Process Lab"	A tour of the different museum facilities was carried out	The combination of sound and sight created an informative and personal museum experience	Very personal experience, so impressions cannot be generalized
Bazán et al. (2018)	Iluminación y satisfacción global en museos de Argentina	Objective and subjective measurements with museum visitors	61% perceived those areas were poorly lit	No correlation between visual aspects integrated into museums and visitor satisfaction
Camacho (2019)	Lighting and overall satisfaction in museums in Argentina	Exploratory study that consisted of carrying out sensory activity with blind adults	Blind people described the activity as entertaining, novel and original	Methodological design applied is not clearly established, nor is sample delimited.
Jung et al. (2019)	"Feelings. Feeling the tiles at the Can Tinturé Museum".	Self-report questionnaires, interviews and measurement of activities	Vibro-tactile and auditory stimulus conditions were pleasant	Small sample and descriptive scope make additional experiments essential
Ducros & Euzéby (2020)	Multisensory at the National Science Museum of Gwacheon	Netnographic study based on visitor opinions on Tripadvisor	Promise of memorable experience through an immersive journey is not fulfilled	Not reported
Wang (2020)	Wine museums "La Cité du Vin" and "Cité de l'Océan"	Questionnaire, in-depth interview and observation	Influence of other senses on the experience was relatively weak	Use of multiple senses without the participation of other approaches would influence the knowledge transfer function
Guzmán y Patiño (2020)	"People by the sea" at Taizhou Museum.	Museum visitors	Monotonous sensation	Sample not calculated probabilistically
Infantes et al. (2020)	"Design of interactive spaces for museums. Pumapungo"	Observation and semi-structured group interview	Positive experience. Several types of sensations were generated	Study with exploratory scope
Zhao (2020)	"Sensory stimulation technology" at Arequipa Museum.	Subjective surveys	Presence or absence of natural light influences the pleasant perception of visitors	Very small number of participants
Santillán (2021)	Impact of natural light. Liaohe Art Museum	Tasting with adult tasters belonging to the indigenous ethnic group of Otavalo	Organoleptic characteristics of dishes were accepted	Work with a small indigenous population
Roa (2021)	"Preparation of the Pachamanka"	Survey to evaluate emotional and sensory experience	Application influenced auditory sensory experience	Small number of participants
Trunfio et al. (2022)	Augmented reality at Eliécer Silva Celis Museum.	Questionnaire for museum visitors	Immersive experience valued by visitors	Limited number of variables to measure experience and satisfaction
Sihvonen & Turunen (2022)	'The Ara It Was' project at the Pacis Museum, Rome.	Interviews and observations	Fair encompasses visually dominant stimuli, while tactile stimuli are somewhat scarce	Dimensions such as smell and taste were not considered

Nota. Regarding the methodology, the following acronyms are used to refer to the scope of the studies: E = exploratory, D = descriptive, C = correlational.

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DISCUSSION

The reviewed scientific literature suggests that the perception of space in museums is influenced by various sensory elements that can significantly impact the visitor experience. These sensory elements include lighting, ambient scent, sound, temperature, texture, color, and the shape of exhibits, among others. In the case of lighting, studies have shown that both photometric measurements and subjective evaluations can affect overall visitor satisfaction. Proper lighting not only enhances the appreciation of artworks but also plays a crucial role in the quality of the visitor experience.

Regarding ambient scent, research indicates that aromas can interact with the perception of art, influencing both the evaluation and memory of exhibits. Pleasant scents can enhance the visitor experience, provided they are in harmony with the exhibition's theme. Similarly, the literature suggests that ambient noise can negatively impact the visitor experience, although the use of music and sound to create meaningful sensory experiences has also been explored as a way to enhance the overall atmosphere. Moreover, ambient temperature in museums has been shown to affect the duration of visits and the overall quality of the visitor experience.

The texture, color, and shape of exhibits also play a significant role in influencing the perception of space and the overall visitor experience. The use of contrasting textures and colors can enhance the perception of artworks, while the shape and arrangement of exhibits can influence how visitors interact with the space. In summary, recent scientific literature highlights the importance of considering a wide range of sensory elements when designing museum exhibitions and spaces, with the aim of creating meaningful and satisfying sensory experiences for visitors.

The literature review identified sensory elements that influence the perception of space and generate meaningful experiences for museum visitors. To this end, only studies establishing statistical correlations between the incorporation of sensory elements in museum design and the aesthetic experience of visitors were considered. It's important to note that recent research quantitatively evaluating this relationship is limited. Most of the studies identified in the review are descriptive, focusing on the implementation of museum proposals without assessing their impact on visitors' aesthetic perceptions.

However, there are exceptions, such as experimental or correlational studies whose results are summarized below. These studies demonstrate that the incorporation of certain sensory elements affects the aesthetic experience of visitors. For example, Zhao (2020) found that the presence or absence of natural light significantly influences visitors' perception of pleasantness. Similarly, González D'Ambrosio (2008) confirmed that including verbal explanations during exhibitions enhances the aesthetic experience for visitors with visual disabilities. In the case of tactile elements, González D'Ambrosio (2008) also found that touch screens positively affect the aesthetic experience of visually impaired visitors. Additionally, Cirrincione et al. (2014) confirmed that the diffusion of aromas within museums impacts visitors' perception and memory of art.

The integration of multisensory elements in museum design has been the focus of several studies. Nechita and Rezeanu (2019) determined that Augmented Reality (AR) not only has educational effects on visitors—through entertainment and empathy—but also produces cognitive responses through emotional immersion. Roa (2021) found that AR influences the auditory sensory experience of visitors through its multisensory signals, while Trunfio et al. (2022) confirmed AR's impact on exhibition satisfaction. Finally, Guo (2019) statistically demonstrated that the integration of visual and auditory signals enhances the aesthetic experience of visitors. One notable gap in the literature is the lack of studies showing a significant association between the integration of taste elements and the aesthetic experience of museum visitors. This gap was addressed in a study conducted in the museums of Cuenca.

Limitations

The primary limitation of this study is the variability in the methodologies and approaches of the reviewed research. Each study operates within its own unique context, scope, and focus, which may limit the generalizability of the findings. Additionally, the diversity of disciplines and perspectives represented in the studies makes it challenging to synthesize a cohesive understanding of how sensory elements influence the museum experience.

CONCLUSION

The literature review on the impact of sensory elements on the aesthetic experience of museum visitors reveals a complex and multifaceted landscape. The research demonstrates that aspects such as touch, sight, sound, and the use of advanced technologies like augmented and virtual reality play a crucial role in shaping how art and culture are perceived and enjoyed in a museum setting. This review aims to provide a comprehensive understanding that can guide future research and practice in exhibition design and museum management, with the goal of creating richer, more inclusive, and memorable experiences for visitors.

The studies analyzed underscore the importance of clear wayfinding and effective signage within museums, as well as the need to consider the bodily and multisensory aspects of art appreciation. The inclusion of accessible tools, such as tactile diagrams and verbal explanations, is essential to ensure that museums are welcoming spaces for all visitors, including those with visual impairments.

The physical and architectural environment of museums—including elements like lighting, visitor density, and indoor environmental quality—also significantly influences the visitor experience. These factors affect not only satisfaction but also the

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perception and memory of artworks. Moreover, the integration of interactive technologies and immersive experiences, such as augmented and virtual reality, opens up new possibilities for enriching the museum experience, making it more engaging and educational.

The implications of this review are significant for future research and practice in the museum field. It is essential that future studies focus on more controlled experiments and interdisciplinary approaches to better understand how different sensory elements interact and contribute to the visitor experience. Additionally, exploring how emerging technologies like augmented and virtual reality can be effectively integrated into museums will provide valuable insights for designing more immersive and educational exhibitions. These advancements have the potential to transform museums into dynamic, responsive spaces that continually adapt to the changing needs of their audiences, thereby enriching the cultural and educational experiences of all visitors.

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