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The role of augmented reality in mediating the relationship between artist intention and viewer perception

Gao Nannan [1], Yuhanis Bin Ibrahim [1,*], Mohd Firdaus Naif Bin Omran Zailuddin [1], Yao Heng [2], Xu Ying [1], Liu Xu [1]

[1]*Faculty of Creative Technology and Heritage, Universiti Malaysia Kelantan, Kota Bharu, Malaysia*
[2]*Chengdu Academy of Fine Arts, Sichuan Conservatory of Music, Chengdu, China*

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ABSTRACT

This study investigates the role of Augmented Reality (AR) in shaping the connection between artistic intention and audience perception in contemporary art. Based on survey responses from 355 participants who engaged with AR-enhanced artworks, the results show that AR technology has a stronger effect on audience perception than the direct intention of the artist. While artistic intention guides how AR is applied, the technology introduces new interpretive possibilities that may alter or even replace traditional modes of artistic communication. These findings suggest a shift toward technology-mediated meaning-making in digital art, with significant implications for curatorial practice and artistic autonomy. The study also shows that AR can either limit or expand audience interpretation, depending on how it is used. Therefore, AR should be applied carefully to support artistic communication while preserving the viewer's interpretive freedom. By addressing both theoretical and practical issues, this study offers guidance for artists and curators who wish to incorporate AR into their work. Future research should explore how different AR technologies influence various art forms to better understand the full scope of AR's impact on the arts.

1. Introduction

The relationship between technology and art has always been positive and negative, especially with the development of new tools that seek to subvert existing forms of artistic communication and its reception. Augmented Reality (AR) technology fundamentally transforms artistic communication by creating new possibilities for bridging artist intentions and viewer interpretation (Chevalier and Kiefer, 2020). This transformation raises critical questions about artistic mediation and the evolving viewer-artwork relationship, extending artistic expression beyond traditional gallery spaces.

Disagreements around the meaning of an artwork and how individuals understand it stem from the traditions of artistic interpretation. The gap, referred to by Roland Barthes and Wolfgang Iser, is viewed from the angle of either being a source of artistic diversity or an impediment to genuine artistic expression. The reality has changed with the introduction of augmented reality, which has moved the focus from an object-centric perspective to a viewer-centered perspective, which, in turn, has altered traditional viewing manners and customs (O'Dwyer et al., 2020; Suhr, 2018). AR has the unique potential to redefine the link between the artist's purpose and the audience's interpretation because of its ability to blend real-time computation with perception, instigating a paradigm shift. This technology facilitates a new dialectic between narrowing and widening the gap in ways that were previously inconceivable (Chevalier and Kiefer, 2020).

Currently, AR technology has a vast range of applications in the art world, from simply providing information to creating fully interactive overhauls of how consumers interact with art. Although AR applications have several limitations like traditional media, enhanced mobile interactions are currently changing exhibition spaces by enabling new forms of audience interaction (Lee et al., 2024). Artists can now create something that resembles a "guided interpretation" experience by adding contextual layers and meaning directly into their pieces. However, the rise of these technologies poses

* Corresponding Author.
Email Address: yuhanishbrahim@umk.edu.my (Y. B. Ibrahim)
https://doi.org/10.21833/ijaas.2025.10.003
Corresponding author's ORCID profile:
https://orcid.org/0000-0001-9232-9337

troubling challenges concerning the balance of artistic power, audience control, and appreciation of art value in the context of modern technology.

The main goals of this research are: (1) to investigate how AR technology acts as a mediator between the artist's intention and the viewer's perception; (2) to study the influence of AR on established forms of artistic communication in galleries, museums, and public spaces; and (3) to develop strategies for using AR in ways that enhance, rather than reduce, the experience of art appreciation. These goals lead to a set of more specific research questions.

1. How does AR technology transform the relationship between creators and audiences?
2. What are the mechanisms through which AR either empowers or constrains viewer interpretation?
3. How can AR be implemented to maximize artistic communication while preserving viewer autonomy?

By studying the current application of AR technologies in different exhibitions, we attempt to grasp the opportunities and challenges provided by AR art experiences.

This research contributes to digital art scholarship by addressing three gaps. First, it extends existing mediation theories by empirically demonstrating how AR creates dynamic, technology-mediated interpretation processes that differ from traditional linear communication models in art. Second, it provides quantitative evidence of AR's influence on viewer engagement and understanding in artistic contexts, moving beyond anecdotal observations to systematic measurement. Third, it bridges praxeological and theoretical gaps by providing implementation suggestions for AR in cultural institutions. In addition to academic discussions, this research highlights the practice of employing AR technologies by cultural institutions, the conceptualization of AR works by artists, and the post-mediation by curators in exhibitions. With the development of AR technologies, this understanding helps guarantee that the advancement of technology is used to improve the human experience of appreciating creativity. This research provides the means to be actively involved in the fusion of AR into artwork in terms of theory and practice and challenges the perception of creative intent and audience engagement in the digital era.

2. Literature review

2.1. Artist intention: Theoretical foundations and communication challenges

Recent research demonstrated that artistic intention operates as a multidisciplinary construct spanning literature, art criticism, and aesthetics. Rogala et al. (2020) revealed that perceiving artistic intention involves complex neural and visual systems that are dependent on viewers' subjective experiences. Contemporary challenges in artistic communication are evidenced by Xhignesse's (2020) analysis of "failed art," highlighting gaps between intended and actual artistic expression. Conservation practices further illustrate these complexities, as Verbeeck (2021) showed how conservators must carefully interpret artistic intentions to preserve aesthetic functions. Emerging AR technologies offer new pathways for expressing artistic intention, with Bongers (2022) positioning extended reality as enabling direct artist–audience interaction that enhances intentional communication.

2.2. Viewer perception: Multidimensional processes in art reception and understanding

Current studies suggest that visual saliency and gaze points affect viewer perception. This is shown in eye-tracking research, which demonstrates that viewer gaze patterns tend to coincide with the focal point of the artist's attention. This indicates a fundamental connection between an artist and an audience in the appreciation of an artwork, whereas the cognitive mechanism responsible for the analysis of an artwork takes shape following the rationale underlying forms of human interaction, which underscores the impact of culture and institutions on perception (McCallum et al., 2020). Furthermore, among the multitude of elements that affect viewers' reception of art, the two most important are the amount of past exposure to the style and the level of originality presented in the artwork. Song et al. (2021) suggested that when viewers first observe abstract paintings, novelty is one of the most important features, which, in their opinion, deserves appreciation. Han (2023) has shown the clear difference in perceptual experience brought by viewing a painting in digital form and in person, where the latter provokes a richer set of perceptual experiences, which indicates that viewing conditions affect appreciation as well. In addition, new approaches have been used in recent studies to improve comprehension of how an audience interprets the view. Eye tracking is a newly developed instrument that is helpful because it analyses the act of seeing along with the audience's response (Bailey-Ross et al., 2019). This demonstrates the influence of contextual information on the experience of digital reproduction and the eye movement of the observer in question. The development of certain theoretical constructions, such as the Vienna Integrated Model of Top-Down and Bottom-Up Processes in Art Perception, has enhanced the comprehension of the cognitive and affective components of art judgement (Reymond et al., 2020).

Emotion registers how a user feels while they are interacting with any artistic content. Art viewers and nonviewers react to emotions such as interest, surprise, confusion, or boredom very differently, as noted by Reymond et al. (2020). Kühnapfel et al. (2024) demonstrated the fundamental importance of basic engagement with art. They stress that

movement and active participation provide information and an understanding of the experiences that have been reported. Examples of visual complexity include composition, content, color, and the viewer's experiences. Guo et al. (2018) model offered methods for predicting and classifying complexity from a higher viewpoint. Overall, these results pose an interesting challenge for understanding how viewers process visual complexity in artwork.

2.3. AR as a mediating technology: Bridging artistic expression and audience experience

Using the Flame series exhibition as a case study, Suhr (2018) argued that AR art creates new relations of tension and possibility in artist-audience dynamics by transforming viewing behaviors and norms. This change is not simply an improvement in technology, as the integration of AR actively redefines how art is appreciated and interacts with; thus, the parameters of communication in art are redefined.

AR's mediating capacity transforms museum and gallery experiences by actively constructing meaning rather than merely transmitting information. He et al. (2018) demonstrated that AR's multimodal features create dynamic interactions between artwork and audience, positioning the technology as an active participant in meaning-making rather than a passive display tool.

The integration of AR into art appreciation has changed the role of the audience from that of a passive viewer to that of an active participant. While viewing viewer engagement, Markov (2022) claimed that art appreciation involves deep emotional understanding that challenges existing frameworks. This level of engagement demonstrates that art has considerable meaning and intent and is communicative in nature, which can be interpreted through AR. Lei and Daud (2023) further elaborated on the effectiveness of the technology in promoting interaction and immersion for the audience in specific implementations, such as AR body painting.

As such, AR serves as a medium through which a computing artist may intend to communicate their artwork. In approaching interactivity and multisensory articulation as forms of communication in Chevalier and Kiefer (2020), the authors noted that AR permits more sophisticated and intricate processes since the concepts can be communicated directly in the artwork. Such mediation alters the expression of art through technology, which raises issues of authenticity and interpretation in augmented reality art experiences.

One of the first factors that needs in-depth examination is acceptance and behavioral issues regarding the use of AR technology in art spaces. Here, Jung et al. (2020) examined the influence of beliefs, attitudes, and time resources on visitors' intentions to use wearable AR in art galleries. The authors found that the effective use of AR mediation also depends on the user's disposition and organizational support in addition to technological possibilities. This comprehension will be crucial in designing AR applications that enhance artistic experience rather than diminish it.

2.4. Hypothesis development

The impact of artistic intention on AR mediation has been studied in detail by contemporary scholars. In their research, Meng and Li (2023) explained how artistic intentions in digital art influence the design of AR products, whereas Lei and Daud (2023) proved the existence of artistic intentions within accepting and engaging AR body painting applications. Bilbow (2021) argued that the purpose of art influences the pursuit of multisensory AR experiences that extend beyond the visual interface. This influence extends to broader creative processes where there are projective aims of art that incorporate AR into cultural projects, and Sovhyra (2020), who proved the ability of artistic intentions to transform the content and context of a phenomenon by using AR. Furthermore, Ronagh et al. (2023) showed the possibility of intentionally creating visual and auditory elements that are logically bound by a single concept to be seen and heard simultaneously in the form of AR. Drawing from these arguments, we assert the following:

H1: Artist intention positively influences the AR technique in artistic contexts.

Aitamurto et al. (2020) discussed how the feeling of presence in a specific environment is augmented using AR technology with respect to entertainment and empathy. Nechita and Rezeanu (2019) demonstrated how emotions engage. In the realm of perceptual difficulties, Liu et al. (2024) and Krajancich et al. (2020) acknowledged that viewers' experiences within AR images are affected by visual parameters such as depth and realism. Lee et al. (2021) and Whang et al. (2021) subsequently explored the effects of AR on viewer perception through telepresence and cognitive focus. Ganesan and Kumar (2024) noted that the impact of AR on the perception of viewers is mediated by engagement, whereas Lugtenberg et al. (2024) and Westermeier et al. (2024) studied the impact of AR on spatial perception and the accuracy of interaction. Therefore, we propose the following:

H2: The AR technique positively influences viewer perceptions of artistic works.

The focus of this study is the impact of the AR technique as a mediator between the intention of the artist and the perception of the viewer. Wu et al. (2020) argued that augmented reality increases experiential estimates in exhibitions, whereas Chevalier and Kiefer (2020) reported that computation-mediated experience transforms an artist's expression. Suhr (2018) described how AR alters the watching of a painting from a passive

activity to one that is more engaging. Furthermore, Markov (2022) presented evidence of how augmented reality (AR) acts as a medium between an artwork's intention and the audience's comprehension through constructive sensory stimulation and autonymic engagement. This allows for the following hypothesis:

H3: The AR technique mediates the relationship between artist intention and viewer perception.

As shown in Fig. 1, our conceptual framework extends mediation theory by demonstrating how AR creates recursive interpretation processes through three pathways: artist intention shapes AR design, AR technology directly influences viewer perception, and technology-mediated interpretations may diverge from original artistic intentions. This challenges conventional assumptions about authorial primacy, positioning technological mediation as potentially dominant in aesthetic experience.

3. Methodology

This study adopts a quantitative approach with a cross-sectional survey design to analyze the relationships among the artist's intention, the AR technique, and the viewer's perception. The research design makes it possible to perform a systematic evaluation of the proposed relationships via statistical procedures based on survey responses from art viewers who had interacted with AR-enhanced artworks. The unit of analysis is individual art viewers, who, because of their interface with the art in question, are most able to articulate their impressions of the artist's intentions and the experiences that were brought about by the AR and its use within the artwork.

This component of the study incorporates all three elements into the conceptual framework. To avoid inconsistencies due to temporality and other unwanted covariate factors, respondents are queried about their last encounter with AR-enhanced artwork to recall within the preceding six months. Furthermore, this design enables the researcher to gather data from a wide range of viewers, which enables the investigation of the degree to which AR technology mediates the relationship between the artist's intentions and the perceptions of viewers of varied demographics and contexts.

This study applies to a quantitative research design with three main variables (artist intention, AR technique, and viewer perception), which all consist of five subitems in the questionnaire. Sample size determination is based on practical approaches alongside the statistical requisites described in the survey methodology literature (Wardropper et al. 2021; Shrestha, 2021; Rahman, 2023).

Scholars suggest that an analysis of factors should be conducted when there are at least ten respondents per item to guarantee stable estimates, although the number is often rounded to twenty to make the estimates more reliable (Rahman, 2023). Considering that the questionnaire has 15 items, an appropriate sample size would be between 150 and 300 respondents. Moreover, considering the mediation analysis involving three variables, this analysis suggests that 300 respondents would be adequate to provide sufficient statistical power (β = 0.80) at the α = 0.05 significance level to detect medium effect sizes (Wardropper et al., 2021).

Data were gathered via Wenjuanxing (wjx.cn), which is an online survey platform popular in China for academic purposes. This platform was chosen because of its advanced features, such as multidevice support, logical controls, and remote monitoring. Tracking IP addresses prevents participants from answering the survey more than once, whereas sophisticated survey logic facilitates the enactment of quality control measures such as attention check questions and response time monitoring. The respondents were expected to take approximately 10–15 minutes to complete the questionnaire. This duration helps collect as much data as possible while not overworking respondents.

All the constructions in this study were measured via multiple items taken from the literature concerning AR technology, artist intention, and viewer perception. Each measurement item was adjusted such that the context was relevant to the study, while the original ideas from the literature were kept intact. All the items were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). To obtain adequate reliability and validity while still maintaining some level of parsimony, each construction was measured with three items, as noted in Table 1. The artist's intention construct, which is influenced by Wharton (2015), aims to capture the communication and preservation of the original artistic intent. The AR technique construct is based on Alam et al. (2021) and Xu et al. (2020), who analyze the effectiveness of AR presentation technology. The viewer perception construct was taken from Weaver et al. (2009), who proposed an understanding and interpretation of the artwork presented via AR by viewers.

The data were processed with SmartPLS 4, which uses partial least squares structural equation modelling (PLS-SEM) suited for analyzing complex relationships in small populations. This method is suitable for reflective and formative models, thus enabling a thorough evaluation of the mediating role of the AR technique on the relationship between artist intentions and viewer perceptions. The measurement model was tested for reliability and validity, with a focus on factor loadings, average variance extracted (AVE), and composite reliability (CR). Confirmed convergent validity includes factor loadings greater than 0.7, AVEs greater than 0.5, and CRs greater than 0.7. The structural model was assessed through bootstrapping for the significance of path coefficients, which showed the strength and direction of relationships. A mediation effect analysis was performed to assess whether AR has the effect of mediating the effect of artist intentions on viewer

perceptions; the role of AR is indicated by significant indirect effects. This approach examines the role of AR in the practice of contemporary art and provides useful information.

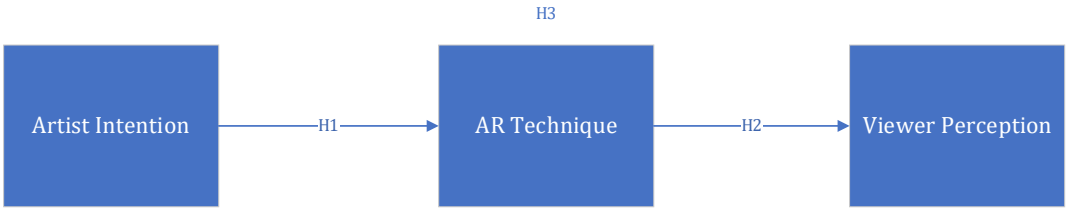

Fig. 1: Conceptual framework

Table 1: Measurement items and sources

Variable	Constructs and items	Reference
Artist intention (AI)	AI1: I believe this AR display faithfully captures what the artist wanted to express. AI2: The AR presentation maintains the core message the artist intended to convey. AI3: I can recognize the artist's original vision through this AR display.	Wharton (2015)
AR technique (ART)	ART1: The AR display makes the artwork more engaging than traditional display methods. ART2: The AR features help me better appreciate the details of the artwork. ART3: The AR presentation creates an immersive viewing experience.	Alam et al. (2021) and Xu et al. (2020)
Viewer perception (VP)	VP1: I find it easy to understand the artwork's meaning through this AR display. VP2: The AR presentation helps me form a clear impression of the artwork. VP3: I can confidently evaluate the artwork's message through this AR display.	Weaver et al. (2009)

4. Results

The study sample consisted of 355 university students studying arts-related majors, primarily young adults, with a majority between the ages of 17 and 29 (64%), including 78 respondents (22%) aged 17- 19, 74 respondents (21%) aged 20- 22, and 73 respondents (21%) aged 26-29. A smaller proportion of respondents were in the 23–25 years age group (19%) or 30 years and older (17%). The gender distribution was nearly balanced, with 181 males (51%) and 174 females (49%) respondents.

Table 2 demonstrates strong reliability and validity across all constructions. All measures exceed recommended thresholds: Cronbach's alpha values range from 0.856-0.869, composite reliability from 0.864-0.882, and AVE from 0.776-0.793. These metrics confirm the measurement model's robustness for testing AR's mediating role between artist intention and viewer perception. These findings surpass the benchmark guidelines of reliability, Cronbach's alpha > 0.7, composite reliability > 0.8, and AVE > 0.5, which signifies the measurement model's credibility. The confidence level in the data collected is extremely high based on these metrics; thus, it is acceptable and valid for testing the impact of AR technology on the relationship between the artist's intention and the viewer's perception in contemporary artworks.

Table 2: Construct reliability and validity

Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE
AR technique	0.856	0.864	0.912	0.776
Artist intention	0.869	0.882	0.920	0.793
Viewer perception	0.862	0.878	0.916	0.783

Path coefficient analysis revealed significant relationships between the constructions in the study. As shown in Table 3, the relationship between the AR technique and viewer perception has a moderate positive effect, with a path coefficient of 0.466, a T statistic of 7.011, and a p-value of 0.000, indicating that the AR technique has a strong and statistically significant influence on viewer perception. The path from artist intention to the AR technique has a path coefficient of 0.542 and a t statistic of 8.240, which is also highly significant, with a p-value of 0.000, suggesting that artist intention plays a crucial role in shaping the AR techniques used. Finally, the relationship between artist intention and viewer perception is weaker, with a path coefficient of 0.252, but it remains significant, with a T-statistic of 4.692 and a p-value of 0.000, indicating that artist intention still positively influences viewer perception, albeit to a lesser extent. These results underscore the importance of both AR techniques and artist intentions in shaping the viewer's experience, with AR having the most pronounced effect on perception.

The outer loadings presented for each indicator demonstrate the strength and reliability of the measurement items in reflecting their respective constructs. As shown in Table 4, all outer loadings are above the threshold of 0.7, indicating that the items reliably measure the constructs. For Artist Intention, the loadings are particularly strong, with AI1 at 0.927, AI2 at 0.888, and AI3 at 0.855, suggesting that these items are highly representative of the construction.

For the AR technique, the loadings are also robust, with ART1 at 0.915, ART2 at 0.854, and ART3 at 0.873, indicating that these items are reliable indicators of the AR technique construct. Finally, for viewer perception, the loadings range from 0.864 for VP2 to 0.916 for VP1, with VP3 at 0.875, all indicating that the measurement items consistently

capture the essence of the viewer perception construct.

5. Discussion

We studied the role of the AR technique in the interplay between artist intention and viewer perception in contemporary art. The results indicate that the AR technique has a significant impact on viewer perception (path coefficient = 0.466), supporting literature claims that interactive features of AR contribute to viewer responses (Chevalier and Kiefer, 2020; Suhr, 2018). The strong effect of artist intention on AR technique (path coefficient = 0.542) confirms that artistic conception substantially influences technological implementation (Markov, 2022; Meng and Li, 2023).

The dominance of the AR technique over direct artist intention (0.466 vs 0.252) represents a fundamental shift in aesthetic experience. These finding challenges Romantic-era assumptions about authorial primacy, suggesting instead a post-human turn where technological interfaces become co-creators of meaning. The implications extend beyond mere enhancement: AR transforms the ontological status of artworks from fixed objects to dynamic assemblages where meaning emerges through technological mediation. This aligns with contemporary theories of distributed agencies while raising profound questions about artistic authenticity and the future of human creativity in increasingly technologized cultural spaces. These findings contribute to aesthetic theory by demonstrating how technological mediation transforms fundamental assumptions about artistic communication, aligning with post-structuralist theories of meaning construction while extending them into visual and spatial art experiences. This technological dominance in meaning-making processes reflects broader philosophical tensions in digital culture. Following Stiegler's concept of "tertiary retention," AR functions as an industrial memory system that shapes collective aesthetic experience. The stronger perceptual impact of AR suggests not merely a new tool for artists, but a fundamental reorganization of the sensible—what Rancière terms the "distribution of the sensible"—where technology determines what can be perceived, thought, and felt in artistic encounters. This raises critical questions: Does AR democratize art by making it more accessible, or does it impose new forms of technological determinism that constrain interpretive freedom?

The implications span multiple domains of contemporary art practice. Museums and galleries must reconsider exhibition design principles, as AR can override traditional curatorial narratives, creating tensions between maintaining artistic autonomy and embracing technological co-creation. The stronger perceptual impact of AR suggests enhanced accessibility for diverse audiences regardless of a formal art education background. Traditional interpretation methodologies require updating to account for technology-mediated meaning-making processes, as AR creates entirely new interpretive pathways that alter how art functions as a communicative medium.

Successful implementations include the Louvre's AR Leonardo da Vinci Experience (Mansur and DeFelipe, 2024) and Tate Modern's optional AR installations, demonstrating an effective balance between technological enhancement and viewer choice (Hammargren, 2017). Best practices involve tiered AR experiences enabling user control, artist collaboration frameworks, and culturally adaptive interfaces. However, this technological dominance raises critical ethical concerns. AR implementations may prioritize spectacle over contemplation, potentially commodifying complex artworks. Privacy issues arise from user tracking in cultural institutions, while the digital divide may create new exclusions based on technological literacy. The risk of predetermined interpretive pathways threatens the open-ended dialogue traditionally characterizing art experience.

Table 3: Mean, standard deviation, T-values, and p-values

Variables	Original sample	Sample means	Standard deviation	T-statistics	P-values
AR technique -> viewer perception	0.466	0.466	0.066	7.011	0.000
Artist intention -> AR technique	0.542	0.544	0.066	8.240	0.000
Artist intention -> Viewer perception	0.252	0.255	0.054	4.692	0.000

Table 4: Outer loadings

Variables	Outer loadings
AI1 <- artist intention	0.927
AI2 <- artist intention	0.888
AI3 <- artist intention	0.855
ART1 <- AR technique	0.915
ART2 <- AR technique	0.854
ART3 <- AR technique	0.873
VP1 <- Viewer perception	0.916
VP2 <- Viewer perception	0.864
VP3 <- Viewer perception	0.875

This study has several limitations. The cross-sectional design and sample of primarily young Chinese university students (64% aged 17-29) limit generalizability across age groups and cultural contexts. Cultural factors may influence findings, as Chinese collective meaning-making patterns differ from Western traditions. The university setting may not reflect diverse exhibition environments, and rapid technological advancement means findings may not apply to emerging AR technologies.

6. Conclusion

AR technology fundamentally alters artist-viewer relationships by creating technology-mediated interpretation processes that can override traditional artistic communication. The strong

correlation between AR technique and viewer perception (β = 0.466) demonstrates technology's capacity to become the dominant force in aesthetic experience.

While AR creates opportunities for deeper interpretation through interactivity and context, it can also constrain interpretation if it is overused or misaligned with the art's core message. A critical balance must be maintained between enhancing perception and preserving artistic integrity, as AR can redirect attention but should not overshadow the artist's primary purpose.

As AR technology becomes increasingly sophisticated, the art world faces a critical juncture. Our findings suggest that technological mediation may soon eclipse human intention as the primary driver of aesthetic meaning, prospects both thrilling and troubling. The challenge for artists, curators, and technologists is not merely to balance enhancement with autonomy, but to reimagine the very nature of artistic communication in an age where algorithms and interfaces co-author our cultural experiences. The future of art may lie not in resisting this technological turn, but in developing new critical frameworks that acknowledge technology as a creative partner while preserving the ineffable human elements that make art transformative.

List of abbreviations

AI	Artist intention
AR	Augmented reality
ART	AR technique
AVE	Average variance extracted
β	Beta (standardized regression coefficient)
CR	Composite reliability
P	P-value
PLS-SEM	Partial least squares structural equation modeling
T	T-statistics
VP	Viewer perception

Compliance with ethical standards

Ethical considerations

All participants provided informed consent prior to their participation in the study, and their responses were collected anonymously to ensure confidentiality.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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