

Museum Education in the Digital Age: The Impact of Digitisation on the Aesthetic Experience

Yangxue Gao

King's College London, London, UK

Abstract: This paper explores the impact of digitisation on aesthetic experiences in museum education. Digital technologies like VR, AR, and interactive multimedia have redefined traditional aesthetic interactions, offering immersive, multi-sensory experiences. The advantages and challenges of these innovations are examined through case studies, including their potential to privatise aesthetics and reinforce cultural capital inequalities. The article highlights the role of critical pedagogy in addressing these challenges, promoting critical engagement and shared experiences. While digitisation enriches aesthetic possibilities, it also demands thoughtful integration to balance innovation with inclusivity in museum education.

Keywords: Museum Education, Digitisation, Aesthetic Experience, Art and Technology, Art Education, Critical Pedagogy.

1. Introduction

In today's digital age, museum education is undergoing unprecedented changes. With the continuous development of technology, it is becoming more and more common for art organisations to use digital technology or platforms to educate and interact (Lee, 2013) [25], which not only changes the way the public accesses and experiences art but also deeply affects their unique aesthetic experience. This has prompted this paper to examine the impact of digitisation on the aesthetic experience of the audience and especially its use and effectiveness in museum education.

Art and aesthetics are inseparable. Aesthetic experience involves not only the perception and appreciation of artworks but also the deep interaction of emotions, rationality and imagination. In traditional aesthetics, aesthetic experience mainly occurs in a 'false' specific scene constructed when the audience watches artworks face to face. However, with the development of digitalisation, relational aesthetics has emerged, and traditional aesthetic experience is being transformed, with viewers being able to appreciate and experience works of art immersively without the constraints of space and time (Walmsley, 2016) [38]. Therefore, the first part of this article begins by exploring the relationship between art and aesthetics and then examines how traditional aesthetic experience is changing in the digital age through 'relational aesthetics', 'reception aesthetic' and Dewey's views on aesthetic experience.

Next, the second part of the article analyses the application of VR, AR and interactive multimedia technologies in museum education through three case studies of participatory digital exhibitions: Random Access, Tate Sensorium and Digital Dream. These technologies provide the public with innovative and diverse aesthetic experiences, by linking to Bourdieu's theory of cultural capital, the advantages and challenges of the digital era for aesthetic experiences are critically analysed.

However, digital technology has been a double-edged sword since its birth. While it extends the aesthetic experience, it also raises the issue of aesthetics appearing to be privatised: digital platforms deprive the public of the opportunity to interact and communicate with others, which significantly limits the shared nature of the aesthetic experience.

Therefore, the third part of the article explores the effective role of museums' implementation of critical pedagogy in relieving this aesthetic dilemma - Guiding the audience to think critically about the work of art. Finally, the article provides constructive thoughts and suggestions for the future development of museum education.

Although this article attempts to explore the impact of digital museums on the aesthetic experience through different periods and kinds of examples, there are still some limitations. Firstly, the development and application of digitisation technologies are constantly changing, with different technologies having different levels of maturity and popularity, so the analysis in this paper cannot cover all digitisation technologies and applications. Secondly, due to space constraints, there is a lack of in-depth comparison of the advantages and disadvantages of different types of digitisation technologies in specific exhibitions and museum applications, and future research should analyse them in a more detailed comparison.

2. Art and Aesthetics

Art is a form of civilisation expression unique to human society, its origin is closely related to the initial aesthetic consciousness of human beings, and the emergence of art stems from the rising aesthetic needs of human beings, so art is not only a reflection of the beauty of reality and social life, but also an object to satisfy people's spirit, which teaches people to perceive objects from a new perspective (Pugh and Girod, 2007) [32]. In contrast, the term aesthetics emerged later than the term art, which dates back to the classical century (Kristeller, 1951) [21].

As an object of aesthetics, the value of a work of art is established based on aesthetic experiences and concepts, and the appreciator obtains aesthetic inspiration by appreciating the work of art for the pleasure of the senses and comprehending the artist's ideas. Aesthetics is not an objective description of art, but a constructive state of mind. The aesthetic senses are physiological functions unique to human beings that can perceive the beauty of an object, as Dewey mentioned when describing the relationship between art and aesthetics, art is the artist's expression of his emotions and thoughts through creation, while aesthetics is the viewer's ability to perceive and appreciate the beauty, which involves

subjective emotions and tastes (Cromer, 1986) [9], so the process of perception is inseparable from aesthetics.

From Ihde's phenomenological perspective, perception is not only a physiological sensory experience but also gives feeling and meaning to artworks (Wiegel, 2010) [39]. Ihde emphasises that perception is not only passive reception but also active interpretation and construction of meaning, which makes the aesthetic experience unique for each viewer (Moens, 2018) [30]. This shows that art aesthetics is a relative concept that varies according to the different backgrounds, cultural environments and experiences of individuals. An explanation for this can be found by linking it to Pierre Bourdieu's theory of cultural capital, in which people with higher cultural capital can perceive and appreciate complex works of art more deeply, while those with lower cultural capital are more able to perceive accessible art forms, which will be discussed in more detail in the section on the impact of digital exhibitions on the aesthetic experience below. According to Jaus's theory of reception aesthetic, the value and significance of artwork lies in the audience's acceptance and understanding, and without the existence of the object, art as a subject has no existence (Johnson, 1987 20; Hosein Qazvini and Hessami, 2020) [19], which is a powerful proof that art and aesthetics are bound together, and the development of art and aesthetic culture complement each other. Jaus also refers to the fact that works of art do not exist in a static state, but continue to acquire new meanings and values through reinterpretation by the audience at different historical periods (Johnson, 1987) [20]. This view challenges the notion of absolutising the value of art in traditional aesthetics and emphasises the social and interactive nature of artworks. Although overemphasizing the audience may lose sight of the original creative intent and intrinsic value of the artwork, which relates to the extension of the aesthetic experience in the context of the modern aesthetic changes that will be discussed in the following section.

2.1. Aesthetic Experience

As mentioned above, aesthetic perception is the beginning of aesthetic experience. For example, as Marković (2012) [26] exemplifies, when people watch works of art (such as movies, plays or paintings), the audience will focus on and immerse themselves in the virtual aesthetic world they have constructed, and their attention will be highly focused on the specific work. In this process, the audience gains new experience of art through their senses and experience then conducts critical reflection on the experience, and finally obtains knowledge.

From the perspective of aesthetic senses, most of the traditional art categories require only a single sense, such as the five common art categories: painting, sculpture, architecture, music and poetry (Kristeller, 1951) [21], which mostly correspond to the visual arts, while only the theatre requires a combination of audio-visual senses, and the same is true for the later emergence of cinema. In the Western aesthetic tradition, many philosophers believe that only the visual and auditory senses can produce aesthetic sensations. In the Western aesthetic tradition, many philosophers have argued that only the two senses, visual and auditory, are capable of producing aesthetic sensations, while the other senses, such as smell and touch, are usually associated with man's lowly desires and carnal pleasures (Kokkos, 2010) [23], thus there are few opportunities for them to participate in aesthetic activities. For example, Plato divided the senses into

aesthetic and non-aesthetic, arguing that only the audiovisual belongs to the aesthetic category, a view that was later followed by Kant and Hegel (Johnson, 1987) [20]; (Kokkos, 2010) [23]. Not only that, in Kant's book Critique of Judgement, he indicates explicitly that aesthetics should be judgement before physiological pleasure because physiological pleasure influences the rightness or wrongness of aesthetic judgement (Bishop, 2012) [4]. This phenomenon arises regarding the long-standing conception of aesthetics based on epistemology - aesthetics is rational.

These theories are now seen as restrictive and absolute, restricting the aesthetic experience to the visual and auditory senses and ignoring the potential value of the other senses, thus limiting the overall understanding and perception of art, and the human aesthetic experience is essentially an integrative process. Friedrich Schiller challenged this view, arguing that "Kant's approach belied the profound connection between art and individual drivers" (Bishop, 2012, p. 290) [4]. Phenomenological aesthetician Maurice Merleau-Ponty also argued that the five senses cannot be felt in isolation (Merleau-Ponty, 1964) [29]. However, these theories have triggered thinking about experiential learning, where experience is divided into active and passive elements (O'Donoghue, 2015) [31]. For traditional art forms, most of them are passive, with artworks neatly arranged in exhibition halls and even arranged for guided tours. Nevertheless, as the constructivist learning theory proposed by Hein (1991) [17] suggests, learning is an active process using sensory input, so increasing public participation is particularly important in the development of contemporary art, and the aesthetic experience has gradually become 'sensual' in contemporary aesthetics.

Dewey (1934) [40] stated in his book Art as Experience that aesthetic experience constitutes a thinking challenge and is an in-depth learning process which promotes the public's deep thinking about works of art (Kokkos, 2010) [23]. This is consistent with David Kolb's experiential learning theory (Das, 2015) [10] that these experiential theories can be effectively applied in art education, as Dewey states that the thinking challenge is conducive to them to assess better and understand the connotations and meanings behind the artworks. Traditional theories of aesthetics provide the basis for aesthetic experience (Brown and Dissanayake, 2009) [5]. Still, the development of contemporary digital technology has revisited and expanded these theories, picking up senses such as touch and smell, which have been abandoned by traditional aesthetics, to form a multi-sensory experience that the public can participate in and create, enriching the aesthetic experience, and consequently leading to a shift in the concept of aesthetics.

2.2. Aesthetic Transformation in the Digital Age

The current media field dominated by the interaction of cutting, copying and collage of digital technology provides a novel and intuitive way of aesthetic experience. The public can not only appreciate artworks in real-time through digital devices but also experience or participate in the creation of art, which brings art closer to public life. In this process, the dialogue and participation of artworks are emphasized. As a result, a new aesthetic theory has emerged-Relational Aesthetics. The Relational Aesthetics proposed by Bourriaud emphasises that artworks are not only visual objects but also mediums of social interaction (Spartin and Desnoyers,

2022) [36], Through this perspective, it is possible to achieve a deeper understanding of how digital technologies have changed the way art is created, disseminated, and consumed, and how these changes have affected the public's perception of aesthetics (Enhuber, 2015) [12].

As mentioned in the aesthetic experience above, aesthetics is the audience's sensory experience of the virtual world constructed by the artwork. In traditional aesthetics, the audience of artworks usually understands the artworks through unilateral imagination and contemplation as bystanders and gets pleasure from thinking. In contrast, on the one hand, the enhanced sensory experience of the public in the digital age, where they have the status of both spectator and participant, makes the artwork no longer a passive aesthetic object. The perception of beauty has turned from the audiovisual to what Ihde calls 'embodiment relations' (Wiegel, 2010, p. 14) [39], aesthetic rationality is transformed into an immersive perceptual experience mediated by technology (Moens, 2018) [30], and this interactivity and participation is an important manifestation of relational aesthetics. On the other hand, traditional artworks have been brought closer to the public, and digital media has broken down the barriers between artists and audiences, giving rise to many virtual art communities. The ability of the audience to easily interact with the artist as well as to speak freely in a virtual community venue reflects the concept of relational aesthetics in which art is a tool for social communication (Spartin and Desnoyers-Stewart, 2022) [36]. Not only that, ordinary people can also create art on the Internet. Although this has enriched the public's aesthetic experience to a certain extent, the 'Aesthetic Oversaturation' caused by the close interaction between art and daily life has also brought challenges. For example, the simple operation of digital media has led to the phenomena of a low barrier of creation and inconsistent quality of creation, and a large number of mediated images have appeared in front of the public as visual stimuli (Lee, 2013) [25], the consumption and abuse of beauty in this situation leads to an aesthetic dilemma - Privatising aesthetics, which to a certain extent influences the formation of the public's aesthetic values. The article will explore how museums can respond to this aesthetic dilemma by applying critical pedagogy in Part Three.

3. The Impact of Digital Exhibitions on the Aesthetic Experience

As a public cultural venue, the museum houses a large number of cultural relics and historical evidence. In other words, As public cultural venues, museums hold a massive collection of cultural artefacts and historical evidence and are symbolic spaces for cultural dissemination, scene construction, and identity recognition. How to change the stereotype of museums and galleries and create an interesting and pleasurable educational atmosphere is a pressing need for many museums.

Today, museums are both experiential and interactive. It embraced and rapidly adapted to the new technology, and to achieve digital transformation museums and galleries began to incorporate several immersive sensory experience programmes (Arnaboldi and Diaz Lema, 2021) [2]. As Vi et al (2017) [37] mentioned in their research paper, to attract visitors and enhance the visitor experience, museums and galleries are committed to exploring new technologies that stimulate the public's senses, and as a result, the museum

identity has shifted from being an exhibitor to being visitor-centred (Charitonos et al, 2012 [6]; Kamariotou et al, 2021) [22]. Museums and galleries around the world have made positive moves to enhance public engagement and experience, for example, The Palace Museum in China, the Museum of Modern Art in the USA, the British Museum in the UK, and the Musée du Louvre in France offer multiple virtual tours and use technologies such as VR, AR and other technologies to add dynamic information to their exhibits, and even set up independent websites to enable visitors to explore the artworks online, providing them a whole range of knowledge and experiences (Evrard and Krebs, 2018) [13]. It is worth mentioning that in the digital museum visit experience, the mediating role of the previous communication media is weakened, and people can have more direct contact with the information so that they can recognise and understand the meaning behind the artwork. On an ideological level, 'reception aesthetics' (Johnson, 1987) [20] and 'intersubjectivity' (Gillespie and Cornish, 2010) [15] flourished in the twentieth century. Accepting the subject-centred concept provides strong support for the creation of interactive art, meaning that the relationship between author, work and visitor has shifted from a one-way model to a two-way interactive model, emphasising the audience's initiative and creativity in the art experience (Kamariotou et al, 2021) [22] and that this shift has provided the audience with more opportunities to actively participate in, and interpret, the work of art, and altered the traditional static viewing and passive experience of art.

For instance, Korean artist Nam June Paik's exhibition *Random Access Music* (1963) demonstrates an exploration of interactive art and is a notable example of the early age of digitalisation in achieving a close interaction between art and the viewer. In the exhibition, Paik encouraged visitors to actively participate in the production of collage music by attaching sections of recorded audio tracks from cassette tapes to the wall to form intricate patterns, enabling audiences to adjust the sequence of playing the tracks to their preferences (Ha, 2017) [16], a design that breaks down the fixity of traditional artwork, therefore making audience participation and interaction at the centre of this work. This exhibition is one of the significant symbols of the early stage of the development of digital interactive art. As Paik mentions in his article "About the Exposition of Music" (Ha, 2017, p. 454) [16], the visitor becoming a participant in the process is his idea of interactive art (Ha, 2017) [16], an idea that emphasises the importance of the interaction between art making and the viewer. As the process of digitisation progresses and digital interactive art intensifies globally, the concept of the participatory museum has been proposed (Simon, 2010) [35]. This concept marks a significant shift in the museum experience, which not only enhances the emotional resonance of the public through interactive and participatory design but also significantly changes the aesthetic experience of the audience.

Tate Sensorium, an exhibition organised at the Tate Gallery in London in 2015, is an example of the participatory museum concept in practice. The exhibition invited visitors to use all five senses to appreciate four artworks selected by the curators to provide a new multi-sensory art experience (Purseley and Lomas, 2018) [33]. The experience of the artwork from Francis Bacon is particularly noticeable in the exhibition, as the viewer is appreciating and experiencing this work, not only are the senses of sight, smell and hearing applied, but

even taste is included. Visitors were requested to eat a piece of chocolate (containing a variety of flavours) to strengthen their appreciation and experience of the artwork (Vi et al, 2017) [37]. This type of exhibition, by stimulating all the senses, undoubtedly leads to a more comprehensive and insightful understanding of the artworks and the meanings behind them. There are some challenges with this multi-sensory experience, although in Vi et al's (2017) [37] participant feedback at the exhibition, it was found that the majority of participants described the experience as interesting, incredible and other such positive terms, which they strongly indicated made them curious. Still, there are a few critical voices that believe that these sensory stimuli are redundant for them, which distracts them and therefore makes it difficult for them to focus on the artwork (Vi et al, 2017)[37], a phenomenon that reflects the fact that multi-sensory interactive design, while enhancing engagement, also interferes with the traditional aesthetic approach of a part of the audience. It is undeniable that innovative technologies do create an immersive aesthetic experience for visitors, effectively engaging a wider audience and arousing their curiosity. As Vi et al (2017) [37] pointed out, the sensory experience elicited strong memories and emotional resonance in participants, and the connection with art became strengthened.

The Cleveland Museum of Art, which uses innovative digital technologies to interact with its visitors, is another example of a digitally engaged museum. It is represented by its Digital Dream, an art installation that utilises projection technology and a touchscreen through which the audience selects different art elements (colours, shapes, textures, etc.) to create their artworks and project them on the wall (Bailey-Ross et al, 2017) [3]. This interactive art installation provides a new approach to art education, where the public's creativity and aesthetic quality are enhanced by actively constructing and building knowledge through a relaxed environment.

Although the above empirical evidence shows that digital technology does provide new ways for the public's aesthetic experience and increases visitors' contact with collections, its disadvantages are also obvious. Firstly, participating in art requires the audience to have a certain degree of initiative and creativity, but not all members of the public have this ability or enjoy this new technology. From the perspective of Bourdieu's cultural capital theory, both interactive installations and participatory experiences require the public to have certain technical knowledge and operational capabilities. When participating in and understanding the creative background and meaning of artworks, will arouse visitors' emotional resonance or spiritual enlightenment to a certain extent (Falk and Dierking, 2012 [14]; Aris et al, 2023)[1]. Audiences who lack relevant cultural capital can be confused or perplexed by engaging with the artwork, struggling to fully experience the interactive art installation. In other words, art appreciation is closely related to the public's educational background, living environment and social status. Individuals differ in their knowledge, experience and even tastes accumulated through education and socialisation processes, and it is those with high cultural capital who are more likely to understand works of art (Scott et al, 2013 [34], Aris et al, 2023)[1]. Therefore, groups with lower cultural capital are likely to be marginalised, thus intensifying inequalities in cultural capital. This echoes Garoian's emphasis on the complexity of audience role transformation in participatory relational art, which states that

the audience is not automatically transformed into an active participant when engaging with relational art; it must cognitively, emotionally, and physically project itself for active participation to occur (Choi, 2013) [7]. In addition, in the study of audience shyness by Scott et al (2013) [34], the psychological barriers and difficulties faced by audiences when participating in exhibitions were revealed, which further provided new theoretical support for audience participation and aesthetic experience. Some audience members feel a lack of self-confidence in art exhibitions or fear that they will be judged by others for their aesthetic insufficiency, thus they are afraid to interact positively and shy to express their opinions. This unsettling psychological state can be traced back to socio-cultural evaluations and expectations of an individual's aesthetic ability, in which the act of aesthetics is traditionally viewed as a form of high-level cultural capital, with symbols of social status and elite recognition, a situation that highlights the fact that aesthetics is not only political and involves a complex relationship between social rights and cultural identities, but even has a hegemonic structure (Aris et al, 2023) [1]. Secondly, although the popularity of digital art has to a certain extent broken the distance between traditional art and the general public, the complex operation of interactive art installations and high exhibition costs limit those groups with lower cultural capital, and the problem of unequal distribution of art aesthetic experience and cultural capital is obvious.

In summary, digital interactive art and participatory museums represent the future direction of the museum experience. Considering the differences in cultural capital of audiences, cultural institutions should aim to create an inclusive environment and design more levels of interactive experiences to satisfy the needs of diverse groups. Through education and guidance, audiences to express their views freely to help the public improve their self-confidence and aesthetic literacy, thus realising the goal of public art education.

4. Critical Pedagogy in Museums

4.1. Aesthetic Personalisation

Digital technologies have changed the way the public perceives, appreciates and understands art, Walmsley (2016) [38] notes that the subject's mode of attention has become progressively dependent on technological mediation, making aesthetic behaviour increasingly rely on a single digital medium. This technologically orientated appreciation, while facilitating the public's access to art, actually diminishes the audience's ability to communicate and interact with the work of art in terms of aesthetics and point of view, which in turn increasingly divorces the meaning of the work of art from the cultural publicness (Charitonos et al, 2012)[6], further leading to the personalisation of aesthetics. The most obvious phenomenon is that when visiting artworks, a large number of viewers often simply glance at the text introduction of the work, take pictures with digital devices, and then move on to the next exhibit. In this process, the creative background and meaning of the artwork are not considered, and exchanging opinions with others or listening to other people's aesthetic understanding are also excluded. Audiences are more concerned with their feelings when viewing works of art than with the public meanings and values conveyed by the works. As a result, the aesthetic practice between people loses its interactive relationship, and the artwork lacks its publicness,

distancing itself from the value it should have as a medium of cultural and social dialogue (Leinhardt et al,2002). Benjamin (2018) [41] in his *The Work of Art in the Age of Mechanical Reproduction* points out that the mechanical reproduction technology of the nineteenth century enabled the efficient production and widespread dissemination of information, which to a certain extent replaced experience. While this information flood facilitates the dissemination of knowledge, it also deprives the public of their ability to perceive and experience (Mayo, 2013) [28]. Similarly, this production of personalisation can be linked to Bakhtin's theory of dialogue, which he views as a process in which different perspectives collide and are discussed as an essential way of understanding and generating meaning. Yet the disappearance of 'intermediality' prevents the public from having the opportunity to dialogue with others (Koschmann, 1999)[24]. While the digital medium provides the convenience of information, it also unintentionally diminishes the opportunity for face-to-face interaction and in-depth discussion. So, the critical pedagogy of the museum offers a solution to this dilemma by giving the public a public space for debate.

4.2. Critical Pedagogy and the Publicity of Works

Critical pedagogy was first advocated by Paulo Freire, who emphasised that the purpose of education is not only the process of imparting knowledge but more importantly the cultivation of critical thinking, aiming to liberate the masses and engage in social revolution as an ethical and political process (Mayo, 2013)[28]. This paradigm of critical education is not only applicable to school education, but it is also closely linked to the public nature of artworks, both of which work together to encourage the audience to gain deeper social awareness and reflection in their aesthetic experience.

The connection between critical pedagogy and the public nature of artworks is mainly reflected in two aspects: firstly, the publicness of artworks is manifested in the representativeness of their social diversity and cultural values, which means that artworks should reflect different social backgrounds and cultural traditions, and provide opportunities for emotional resonance and understanding for a diverse public. Secondly, publicness is also expressed in the exploitative and interactive nature of artworks for the public. Technological innovations in the digital age have opened up new possibilities for the public nature of works, enabling the public from different backgrounds to participate in creating and sharing art and culture, breaking down traditional elite cultural barriers. Nevertheless, the public nature of a work is not just about openness and accessibility, but also about its educational and inspiring role for the public. This means museums should encourage audiences to question existing social, cultural and political structures through their exhibitions and educational programs, thereby promoting wider social participation and change. The Tutankhamon immersive exhibition at Madrid Digital Arts is a thought-provoking example of the relationship between critical pedagogy and the public nature of work. This immersive exhibition takes visitors back to the mysterious world of ancient Egypt, where they can explore the secrets of the Nile and experience the original colours and states of these buildings more than 3,500 years ago (Madrid Digital Arts, 2024) [27]. This visual and interactive approach allows the public to examine how ideologies of art and history

perpetuate myths and beliefs in society, culture and politics (Clover and Sanford, 2016) [8]. Visitors to the Tutankhamon exhibition's immersive experience of Ancient Egypt guided them to consider the values of ancient civilisations and the impact of these values in modern society, questioning and reflecting on the significance of Ancient Egyptian artifacts in contemporary society, thus breaking down fixed notions of traditional culture and history, and achieving a broader publicness.

Therefore, in contemporary society, the ability to appreciate aesthetics critically has become particularly important to the public. This ability is not only limited to the perception of the external form of artworks but also focuses on a deep understanding of the cultural, historical and ideological connotations behind the works. As exhibitions and museums are significant cultural venues, if some exhibitions are biased or one-sided in presenting history and culture, emphasising a particular viewpoint or ideology, this will directly affect the public's understanding of historical events or cultural phenomena. In this context, critical cultural pedagogy can help the audience examine the ideologies and power relations behind the exhibition (Witcomb, 2012). This critical aesthetic ability not only enhances the audience's understanding of the artwork but also enhances their sense of participation at the social and political. Educational practitioners and museum curators require particular attention to balancing and presenting multiple cultural perspectives when designing exhibitions and educational programmes. The following are suggestions for educators and museums to enhance audiences' aesthetic experiences based on critical pedagogy.

As explained in part two, an individual's level of cultural capital plays an essential role in the understanding and perception of artistic experience. As aesthetic preferences are constantly being redefined in the social environment, individuals may obtain or lose cultural capital through exposure to evolving cultural forms (Hanquinet et al, 2014) [18]. Therefore, educational practitioners should develop curricula or curate exhibitions that showcase a broad range of cultural forms and practices to encourage appreciation and critical engagement with diverse cultural expressions (Earle, 2013) [11]. For instance, digital exhibitions can overcome geographical and historical limitations to display artworks from different regions and cultural traditions, enabling viewers to experience aesthetics and ways of thinking from all over the world, and this multicultural presentation and cross-cultural exchange helps to broaden the individual's cultural horizons. On this foundation, it is crucial to create an environment where different aesthetic preferences can be freely explored and discussed, for example, by organising thematic exhibitions or workshops that allow the audience to interpret and discuss artworks from various perspectives. Individuals are free to express their aesthetic views to each other because critical thinking can only truly develop when diverse aesthetic views are respected and exchanged. As Boal dictated: "only aesthetics [can] enable us to attain the truest and most profound comprehension of the world and society" (Clover and Sanford, 2016 . p.138) [8]. This view reflects, in part, the role of art as a unique cognitive tool for triggering thought and dialogue through emotion, reason and imagination, thus helping people to understand society and culture more fully. In avoiding didactic exhibitions, museums can increase the depth and breadth of arts education through cross-institutional

collaborations to jointly develop and promote digital arts education resources that enable the public to construct their world of knowledge through participatory experiences (Hein, 1991)[17]. At the same time, sharing arts education resources will also help improve the effectiveness and accessibility of arts education. In museum education, experience emerges from learning when visitors can actively engage with works of art, generating different reflections and experiences that foster critical thinking ((O'Donoghue, 2015)[31]. This approach fits with Dewey's (1934) view that "a work of art is only complete when it functions in the experience of others" (O'Donoghue, 2015, p. 112)[31].

How to further popularise digital arts education is a future research direction, which includes developing more high-quality, easily accessible and interactive digital arts education resources to meet the needs of audiences of different ages and backgrounds. Furthermore, the training of educators and museum staff in digital skills needs to be strengthened, and the public's ability to understand and apply digital technologies needs to be enhanced, making education and training in relevant digital knowledge skills essential. Critical aesthetic appreciation is more than just perceiving and understanding works of art; it is an integrated process of cultural identity, social engagement and thought development.

5. Conclusion

The digital age in art offers new possibilities for aesthetic experience but also brings unprecedented challenges. By reviewing and rethinking the sensory bias in traditional aesthetic theory, this article discovers the importance of multi-sensory experience in the evolution of contemporary aesthetics. From the perspective of relational aesthetics, the aesthetic revolution in the digital era not only modifies the form and dissemination of artworks but also profoundly influences the audience's aesthetic concepts and ways of experiencing. Examples such as Tate Sensorium and Tutankhamon, presented in the article, show that changes in art forms and modes of communication in the digital age have allowed for a redefinition of traditional ways of experiencing aesthetics and the possibility of multi-sensory experiences. The immersive digital exhibition not only enriches the audience's aesthetic experience but also prompts a rethinking of the relationship between art and technology, the individual and society. Such interactive art projects greatly enhance public engagement and aesthetic experience, demonstrating the great potential of digitisation in art and education. Also, as mentioned in the text, the theory of cultural capital, this form of interaction requires that the public needs to have a certain level of knowledge and skills otherwise they will not be able to fully experience the interactive art installations, which in turn exacerbates the inequality of cultural capital. In the context of the politics of art and aesthetics, the application of critical pedagogy in museums is crucial, emphasising the need for arts education to focus on both the transmission of knowledge and the development of critical thinking. Presenting historical narratives through digital technology can help viewers recognise the ideologies and power relations behind works of art, prompting them to think about and analyse works of art from multiple perspectives, form independent aesthetic judgements, and question and reflect on existing social, cultural and political structures. In the future, with the continuous optimisation of digital technology, art and aesthetics will continue to explore new boundaries to promote social and cultural progress. In summary, museum education

in the digital age provides audiences with new aesthetic experiences and brings opportunities to reinvent cultural capital.

References

- [1] Aris, S., Aeni, B., & Nosrati, S. (2023). A digital aesthetics? Artificial intelligence and the future of the art. *Journal of Cyberspace Studies*, 7(2), 219-236. doi:10.22059/jcss.2023.366256.1097
- [2] Arnaboldi, M., & Diaz Lema, M. L. (2021). The participatory turn in museums: The online facet. *Poetics*, 89, 101536. doi:10.1016/j.poetic.2021.101536
- [3] Bailey-Ross, C., Gray, S., Ashby, J., Terras, M., Hudson-Smith, A., & Warwick, C. (2017). Engaging the museum space: Mobilizing visitor engagement with digital content creation. *Digital scholarship in the humanities*, 32(4), 689-708. doi:10.1093/llc/fqw041
- [4] Bishop, C. (2012). *Artificial hells : Participatory art and the politics of spectatorship*. Verso.
- [5] Brown, S., & Dissanayake, E. (2009). The arts are more than aesthetics: Neuroaesthetics as narrow aesthetics. In M. Skov & O. Vartanian (Eds.), *Neuroaesthetics* (pp. 43–57).
- [6] Charitonos, K., Blake, C., Scanlon, E., & Jones, A. (2012). Museum learning via Social and mobile technologies: (HOW) can online interactions enhance the visitor experience? *British Journal of Educational Technology*, 43(5), 802–819. doi:10.1111/j.1467-8535.2012.01360.x
- [7] Choi, S. (2013). Relational aesthetics in art museum education: Engendering visitors' narratives through participatory acts for interpretive experience. *Studies in Art Education*, 55(1), 51–63. doi:10.1080/00393541.2013.11518916
- [8] Clover, D., & Sanford, K. (2016). Contemporary Museums as pedagogic contact zones: Potentials of Critical Cultural Adult Education. *Studies in the Education of Adults*, 48(2), 127–141. doi:10.1080/02660830.2016.1219495
- [9] Cromer, J. L. (1986). Integrating art and aesthetics. *Design For Arts in Education*, 87(4), 13–17. doi:10.1080/07320973.1986.9937367
- [10] Das, S. (2015). Using museum exhibits: An innovation in experiential learning. *College Teaching*, 63(2), 72–82. <https://doi.org/10.1080/87567555.2015.1005044>
- [11] Earle, W. (2013). Cultural education: Redefining the role of Museums in the 21st Century. *Sociology Compass*, 7(7), 533–546. doi:10.1111/soc4.12050
- [12] Enhuber, M. (2015). Art, space and technology: How the digitisation and Digitalisation of art space affect the consumption of art-a critical approach. *Digital Creativity*, 26(2), 121–137. doi:10.1080/14626268.2015.1035448
- [13] Evrard, Y., & Krebs, A. (2018). The authenticity of the museum experience in the digital age: the case of the Louvre. *Journal of Cultural Economics*, 42, 353-363.
- [14] Falk, J. H., & Dierking, L. D. (2012). *The museum experience revisited*. Taylor & Francis Group.
- [15] Gillespie, A., & Cornish, F. (2010). Intersubjectivity: Towards a dialogical analysis. *Journal for the Theory of Social Behaviour*, 40(1), 19–46. doi:10.1111/j.1468-5914.2009.00419.x
- [16] Ha, B.(2017) Interactive Art Based on Musical Genealogy: Nam June Paik's Random Access. 453-460
- [17] Hein, G. E. (1991). *Constructivist learning theory*. Institute for Inquiry. Available at:<http://www.exploratorium.edu/ifi/resources/constructivistlearning.html>S.

- [18] Hanquinet, L., Roose, H., & Savage, M. (2014). The eyes of the beholder: Aesthetic preferences and the remaking of Cultural Capital. *Sociology*, 48(1), 111–132. doi:10.1177/0038038513477935
- [19] Hosein Qazvini, N., & Hessami, M. (2018). The role of literary texts in interpretations by museum audiences. *The International Journal of the Inclusive Museum*, 11(4), 21–35. doi:10.18848/1835-2014/cgp/v11i04/21-35
- [20] Johnson, P. (1987). An aesthetics of negativity/an aesthetics of reception: Jauss's dispute with Adorno. *New German Critique*, (42), 51–55. doi:10.2307/488256
- [21] Kristeller, P. O. (1951). The modern system of the arts: A study in the history of aesthetics part I. *Journal of the History of Ideas*, 12(4), 496–527.
- [22] Kamariotou, V., Kamariotou, M., & Kitsios, F. (2021). Strategic planning for virtual exhibitions and visitors' experience: A multidisciplinary approach for museums in the digital age. *Digital Applications in Archaeology and Cultural Heritage*, 21, e00183.
- [23] Kokkos, A. (2010). Transformative learning through aesthetic experience. *Journal of Transformative Education*, 8(3), 155–177. doi:10.1177/1541344610397663
- [24] Koschmann, T. D. (1999). Toward a dialogic theory of learning: Bakhtin's contribution to understanding learning in settings of collaboration.
- [25] Lee, R. (2013). Arts organizations and Digital Technologies. Retrieved from <https://www.pewresearch.org/internet/2013/01/04/arts-organizations-and-digital-technologies/>
- [26] Marković, S. (2012). Components of aesthetic experience: aesthetic fascination, aesthetic appraisal, and aesthetic emotion. *i-Perception*, 3(1), 1–17.
- [27] Madrid Digital Arts (2024). Tutankhamun. Retrieved from <https://madridartesdigitales.com/en/exhibitions/tutankhamun/>
- [28] Mayo, P. (2013). Museums as sites of critical pedagogical practice. *Review of education, pedagogy, and cultural studies*, 35(2), 144–153. doi: 10.1080/10714413.2013.778661
- [29] Merleau-Ponty, M. (1964). *Sense and non-sense*. Northwestern University Press.
- [30] Moens, B.G. (2018) 'Aesthetic experience in Virtual Museums: A postphenomenological perspective', *Studies in Digital Heritage*, 2(1), pp. 68–79. doi:10.14434/sdh.v2i1.24468.
- [31] O'Donoghue, D. (2015). The turn to experience in contemporary art: A potentiality for thinking art education differently. *Studies in Art Education*, 56(2), 103–113. doi:10.1080/00393541.2015.11518954
- [32] Pugh, K. J., & Girod, M. (2007). Science, art, and experience: Constructing a science pedagogy from Dewey's aesthetics. *Journal of Science Teacher Education*, 18(1), 9–27. doi:10.1007/s10972-006-9029-0
- [33] Pursey, T., & Lomas, D. (2018). Tate Sensorium: An experiment in multisensory immersive design. *The Senses and Society*, 13(3), 354–366.
- [34] Scott, S., Hinton-Smith, T., Härmä, V., & Broome, K. (2013). Goffman in the gallery: Interactive art and visitor shyness. *Symbolic Interaction*, 36(4), 417–438. doi:10.1002/symb.74
- [35] Simon, N. (2010). The participatory museum. *Museum 2.0*.
- [36] Spartin, L., & Desnoyers-Stewart, J. (2022, July). Digital Relationality: Relational aesthetics in contemporary interactive art. In *Proceedings of EVA London 2022* (pp. 150–157). BCS Learning & Development.
- [37] Vi, C. T., Ablart, D., Gatti, E., Velasco, C., & Obrist, M. (2017). Not just seeing, but also feeling art: Mid-air haptic experiences integrated in a multisensory art exhibition. *International Journal of Human-Computer Studies*, 108, 1–14. doi:10.1016/j.ijhcs.2017.06.004
- [38] Walmsley, B. (2016). From arts marketing to audience enrichment: How digital engagement can deepen and democratize artistic exchange with audiences. *Poetics*, 58, 66–78. doi:10.1016/j.poetic.2016.07.001
- [39] Wiegel, L. (2010). Perception in the digital age, *Analysing aesthetic awareness of changing modes of perception*. Pp.1-74.
- [40] Dewey, J. (2008). Art as experience. In *The richness of art education* (pp. 33–48). Brill.
- [41] Benjamin, W. (2018). The work of art in the age of mechanical reproduction. In *A museum studies approach to heritage* (pp. 226–243). Routledge.