How Destination Image Building Tourists' Immersive Experience for Online Tour and Stimulate the Intention to Visit in Person

Wei Sun[1], Liwei Li[2], Yidong Liu[2], Fengyuan Sun[3], Ya Zhu[4].
[1]School of Art Design, Shandong Youth University of Political Science, Jinan, CO 250103 CHINA
[2]College of Design, Hanyang University, Ansan, CO 15588 South Korea
[3]College of Art, Qingdao University of Science and Technology, Qingdao, CO 80309 CHINA
[4]Conservatory of Music, Guangxi Arts University, Nanning, CO 266061 CHINA

Corresponding author: Yidong Liu (e-mail: vintonl@163.com).

ABSTRACT This study investigates the impact of destination image in online tourism on tourists' intention to travel in person, as well as the role that immersive experience plays in this relationship. Using data collected from 644 tourists, the findings suggested that the three dimensions of destination image in online museum visits are all significantly positively related to the immersive experience, and it worked the same way to tourist satisfaction. Both the immersive experience and satisfaction during online museum visits are significantly positively related to tourists' intention to visit the site in person. Among the three dimensions of destination image, cognitive image and overall image are significantly positively related to tourists' intention to visit the actual site, while the emotional image has no significant correlation with the intention to visit in person.

INDEX TERMS Online Museums; Destination Image; Immersive Experience; Tourist satisfaction; Travel Intention

I. INTRODUCTION

The iteration and updating of the tourism industry rely significantly on the application and enhancement of technology, especially with the highly development of virtual reality technology, which is driving swift innovations across various types of tourism [1]. In recent time more and more museums have begun to create online tour spaces, leveraging VR technology to build online tour metaverses. Online museums largely alleviate the physical constraints of time and space on visitors' museum experiences, making museum resources more accessible, while also providing visitors with experiences distinct from physical visits [2]. As public understanding and acceptance of new technologies improve, more visitors are starting to explore online museum tours and are finding them to be quite satisfactory.

For the museum industry, online tours serve as a supplement and extension to physical visits, how to effectively convert visitors from online tours to physical site visits remains a key concern for many museums [3]. For visitors, the quality of the online tour experience and their interactions with exhibits largely determine their initial impressions and perceptions of the museum, and further stimulate their intention to visit in person. Existing research indicates that whether visitors can achieve a high-quality immersive experience and establish deep interactions with the exhibits during online tours often directly impacts their intention to visit the physical museum [4].

Research on the relationship between individual travel intention and tourism destination image is abundant, and the perspectives are diverse. Some have explored the impact of tourism motivation on destination image and tourists' travel intentions [5], while others have confirmed that destination attributes can directly affect the destination image and determine tourists' travel intentions [6]. There are also studies that have investigated the role of different dimensions of immersive experiences in shaping the tourism destination image and its impact on tourists' travel intentions [7]. However, no research has yet explored the impact of the tourism destination image on travel intentions with immersive experience as a mediating variable. This research

fills that gap. At the meanwhile, existing research generally focuses on the impact of the tourism destination image on tourists' online browsing satisfaction and travel intentions [8]. However, for institutions such as museums with physical exhibition spaces, online platforms serve as both channels for presenting exhibits and bridges for attracting more visitors to travel to the actual site based on their online browsing experience. This research attempts to delve deeper into this perspective, analyzing the impact of the online browsing experience on tourists' intentions to visit the physical location, thus filling a current research gap in this area.

The research process of this study will take the S-O-R model to be the theoretical framework. In the S (Stimulus) section, it will be focus on the three dimensions of destination image during online museum tours. In the O (Organism) section, the study will assess the immersive experience and visitor satisfaction generated during the tour. Finally, the R (Response) section will examine the travel intention to the physical museum after completing the online tour [9]. By constructing this research system and theoretical framework, the study aims to specifically analyze which factors during the online museum tour contribute to the formation and establishment of the audience's immersive experience, build visitor satisfaction, and ultimately stimulate the travel intention to the physical museum.

II. LITERATURE REVIEW

A. CONCEPT DEFINITIONS

1) ONLINE MUSEUMS

Online museums refer to digital platforms that display museum collections and exhibitions through the internet without relying on physical space. These platforms can be independent websites, applications, or exhibitions integrated into other virtual environments. Online museums use various technologies, such as VR, AR and 360-degree panoramic images, to give visitors with an immersive experience during their tours [10]. There are some typical characteristics of online museums. On one hand, the exhibits are presented in a digital format, and visitors cannot view the physical objects directly [11]. On the other hand, online museums usually offer high accessibility and strong interactivity. The visiting process is not constrained by geographical location or real-time, and it can provide effective interactions to visitors overall the tour [12].

2) IMMERSIVE EXPERIENCE

The concept of immersive experience (IE) was first introduced by American psychologist Csikszentmihalyi (1975) [13]. Based on interviews with athletes, artists, rock climbers, and other activity participants, he discovered that a prominent sense of immersion and pleasure arises during their activities. This feeling is a significant motivation for them to repeatedly engage in these activities. The study introduced the psychological concept of "flow experience", which has since been widely disseminated and applied across various fields. Subsequent research has increasingly enriched the concept, generating additional theories. Mütterlein, J., & Hess (2017) pointed out that the occurrence of IE is directly related to the interaction between users and their environment; an appropriate environment must continuously provide effective stimuli to elicit such deep experiences [14]. McLean, G., & Wilson (2019) noted that due to individual differences, perceptions and responses to external environments can vary significantly, resulting in different IE for different individuals in the same environment [15]. Zhang, C. (2020) approached the concept from the user's perspective, stating that IE is a sum of various emotional changes. Individuals' cognition, memory, emotions and responses to external environments all stimulate these emotional changes, thereby facilitating the formation of an IE [16].

B. THEORETICAL BACKGROUND

1) SOR

The SOR theory originated from the "Stimulus-Response" model proposed by John B. Watson (1919). This model effectively explained the series of behavioral responses individuals exhibit in reaction to external stimuli. However, it did not analyze changes in individuals' psychological states following exposure to stimuli [17]. Building on this, Mehrabian & Russell (1974) introduced the "Organism" component, evolving the "Stimulus-Response" model into the S-O-R model, which represents the early form of the SOR [18]. This model has been widely applied across various fields, offering targeted analysis of the behavioral and cognitive responses individuals have to external environmental stimuli. In this model, S refers to the various external factors that stimulate the individual; O represents the internal processing between the external stimulus and the final response; and R denotes the individual's specific responses, including subjective behavioral choices such as avoidance or approach.

The SOR model serves as a solid theoretical framework for studying many issues, particularly those involving the influence of user experience and user perceptions on their behavioral intentions. The focus of this study lies in how tourists' perceptions during online tours influence their post-tour behavioral intentions. Therefore, the SOR theory is not only well-suited but also provides a solid theoretical foundation for this study.

2) THEORY OF DESTINATION IMAGE

It was first introduced by Hunt in 1971 the concept of "destination image" [19]. Although this concept has been around for over 50 years, there is still no complete consensus in academia regarding the specific factors that constitute destination image. As the application of this concept has become more widespread, its meaning and components have continued to evolve. Crompton (1979) view destination image as a combination of an individual's specific perceptions, feelings, ideas, and impressions of a place, which are related to their personal experiences [20]. Embacher J (1989) define it as the selective perceptions or viewpoints formed by individuals based on their actual observations and experiences of a destination, reflecting both their evaluations and certain cognitive aspects [21].

Additionally, Gartner W C (1993) propose that destination image has different levels, which can be analyzed from cognitive, emotional, and intention (or motivation) perspectives [22]. However, the intention mentioned here refers to the possibility of tourists traveling to a specific destination within a particular time frame. Essentially, it describes tourists' behavioral tendencies and can be regarded as the reflection of the tourism image in their minds, rather than a dimension for evaluating the image. This study was the first one to propose a preliminary categorization of destination image, suggesting that the destination image can be evaluated from different dimensions. However, the categorization method has not gained widespread acceptance in the academic community. Most subsequent scholars believe that the image of a tourist destination should at least encompass both cognitive and affective dimensions [23-25].

Based on existing research findings, Baloglu & Mccleary (1999) proposed that the image of a tourist destination should be measured from three dimensions [26]. In addition to the cognitive and affective dimensions widely recognized by earlier scholars, their study introduced the overall image dimension as a supplement.

The cognitive image (CI) objectively assesses the external perceptions that a tourist destination provides to visitors, such as the state of facilities, service quality, and the development of scenic areas. The affective image (AI), on the other hand, measures the internal feelings experienced by tourists during their visit, such as whether the destination makes them feel relaxed, joyful, or even immersed, helping them forget their worries.

The overall image (OI) serves as a supplement to these two dimensions, representing both a synthesis of the cognitive and affective aspects and a direct reflection of visitors' overall impressions of the destination. This includes whether the destination meets visitors' expectations, whether

it leaves them satisfied, and whether it inspires their interest in returning for another visit.

This theory is widely applied in research and offers a highly applicable perspective for analyzing and interpreting destination image. This paper will adopt this definition and analyze the destination image from the three dimensions of CI, AI and OI.

3) IMMERSIVE EXPERIENCE

Immersive experience can be measured through various dimensions, and as related research has expanded, the measurement methods have become increasingly refined, leading to the development of various scales. Csikszentmihalyi (1990) identified nine dimensions of IE, a classification widely accepted in academia [27]. Building on previous research, Jackson & Marsh (1996) developed the Flow State Scale (FSS) for measuring IE during activities or sports [28]. Chen J.V., Htaik S., et al. (2017) proposed adding dimensions of time perception and concentration to the commonly used scales [29]. Lee B.C. (2019), using cultural heritage sites as the research background, suggested that in addition to time perception and concentration, the degree of environmental automation should also be considered in the IE assessment [30]. Kim J.J., Kim I. (2019) proposed testing IE based on curiosity, concentration, and enjoyment in his reach for Chinese students dining out in South Korea. In this study, to assess visitors' IE, the research will incorporate representative issues based on current academic findings and typical research outcomes, forming relevant survey content [31].

The formation of an immersive experience is based on an individual's perception of the external environment. In the context of this study, this perception of the external environment is established through the destination image. During the tour, tourists' various perceptual images of the online museum serve as the source of their perceptions and experiences. These perceptions of the destination image directly determine whether tourists can achieve an immersive experience, with a close and inherent connection existing between the two.

C. HYPOTHESIS DEVELOPMENT

1) DESTINATION IMAGE AND IMMERSIVE EXPERIENCE

Studies have shown that the destination image significantly influences the overall perceptions and experiences of visitors during their visit, particularly in determining whether they can achieve an IE during the tour. Firstly, the level of understanding and recognition that tourists have of a site during their visit CI directly affects whether the site can effectively capture and maintain their attention. High attention concentration is a crucial prerequisite for IE [32].

Secondly, the AI conveyed by the site during the visit can directly enhance the tourists' experience and perception. When a site or specific exhibits evoke strong emotional resonance or create unforgettable emotional experiences, this can directly trigger a sense of IE, allowing tourists to fully engage with the context created by the site or exhibits [33]. Finally, tourists' perception of the OI of the exhibits, especially when they develop a positive and favorable image, allows them to immerse more deeply in the well-created atmosphere of the exhibits, leaving a lasting impression. This also contributes to the generation of IE [34].

Based on this comes to the following hypotheses:

H1: The positive CI of online museums (e.g., rich exhibits, reasonable layout) significantly enhances tourists' IE.

H2: The positive AI of online museums (e.g., enjoyable, relieving stress) significantly enhances tourists' IE.

H3: The positive OI of online museums (e.g., satisfying, creating anticipation) significantly enhances tourists' IE.

2) DESTINATION IMAGE AND VISITOR SATISFACTION

As supported by various studies, the destination image also directly determines visitor's satisfaction (SA) with the tour experience. First, the CI of a tourism destination, which includes factual knowledge and perceptions such as landmarks, climate, and available activities, shapes visitors' initial impressions and overall experience of the destination. This experience directly impacts visitor's SA, with a positive CI leading to higher SA levels [35]. Additionally, the AI of the destination during the tour also influences SA. This AI refers to the feelings and emotional responses associated with the destination, such as excitement, relaxation, or adventure. Memorable AI leads to greater emotional engagement and appreciation of the destination, thus enhancing SA levels [36]. Lastly, the OI of the destination, including factors such as the museum's ambiance, the quality and layout of exhibits, and the interactive experiences during the tour, constitutes the OI of the destination. A positive OI is a key factor in increasing visitor's SA [37].

Based on this comes to the following hypotheses:

H4: The positive CI of online museums (e.g., convenient visits, high service quality) significantly improves tourists' SA levels.

H5: The positive AI of online museums (e.g., relaxing) significantly improves tourists' SA levels.

H6: The positive OI of online museums (e.g., encouraging revisits) significantly improves tourists' SA levels.

3) IMMERSIVE EXPERIENCE, TOUR SATISFACTION, AND TRAVEL INTENTION

The specific experiences and perceptions of visitors during online tours are closely related to their travel intention (TI) in person [38]. First, an IE during the online tour enhances the visitors' sense of presence, which not only leaves a strong impression of the exhibits and the site but also stimulates a strong desire to visit the physical location for a more in-depth exploration of it. This positive experience directly triggers the TI [39]. Additionally, a high level of SA during the online tour increases visitors' recognition and desire to explore the actual site, thereby enhancing their TI [40]. Finally, the IE visitors gained during the tour leaves a memorable impression, helping visitors capture valuable information about the site or exhibits quickly and effectively. This memorable experience and perception lead to greater SA with the tour and a higher level of SA with the site or exhibits [41].

Based on this comes to the following hypotheses:

H7: IE during online museum tours positively impacts the TI after the tour.

H8: SA with online museum tours positively impacts the TI after the tour.

H9: IE during online museum tours positively impacts SA. The different dimensions of the destination image during online tours are also related to visitors' TI [42]. A positive CI of the destination created during the online tour increases the perceived value of the site or exhibits in their minds, leading to a greater interest in further exploring the site or exhibits and a stronger TI [43]. Similarly, if the EI during the online tour resonates strongly with the visitors, evoking significant emotional impact or resonance, it not only enhances their IE but also helps stimulate their intention to visit the actual site (TI) [44]. Finally, a positive OI during the online tour contributes to a satisfying viewing experience. Research shows that a good OI creates an enjoyable online tour experience, leading to higher expectations of the actual site and significantly enhancing the intention to visit in person [45].

Based on this comes to the following hypotheses:

H10. The positive CI of online museums (e.g., exhibits showcasing cultural depth) significantly enhances tourists' intentions for on-site visits.

H11. The positive AI of online museums (e.g., creating memorable emotional experiences) significantly enhances tourists' intentions for on-site visits.

H12. The positive OI of online museums (e.g., being perceived as a high-quality attraction) significantly enhances tourists' intentions for on-site visits.

D. PROPOSED RESEARCH MODEL

The research utilizes the S-O-R model as its framework, integrating theories of destination image and immersive experience, constructing the current research model as follow:
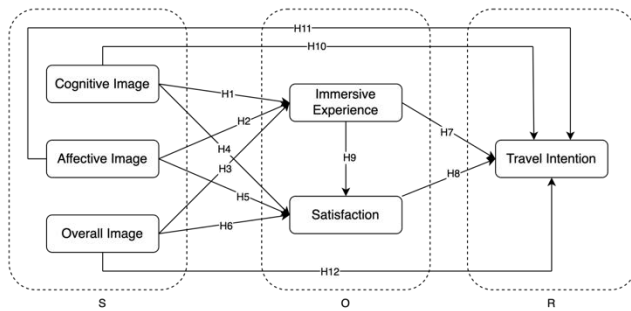
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FIGURE 1. **Proposed Research Model**

Ⅲ. METHODS

A. RESEARCH SUBJECT
In this study, the Dunhuang Academy is selected as the research case. The Dunhuang Academy is located in Dunhuang City, Gansu Province, and is responsible for the research of the world cultural heritage sites including the Mogao Caves, the Maiji Caves, and the Bingling Caves. It is also a national first-class museum that exhibits these important cultural heritages to visitors from all over the world.

B. QUESTIONNAIRE
There are two main sections for the questionnaire for this study. The first section will gather basic information. The second section focuses on the specific experience and perceptions of visitors regarding the online museum tour, consisting of four aspects. The first aspect explores visitors' perceptions of the tourism destination image during the online museum tour (including CI, AI and OI). The second aspect investigates the IE gained during the online tour. The third aspect measures the level of SA with the online tour. The fourth part assesses the TI after completing the online tour [46].

C. Tour Navigation Process
After searching for "Exploring Dunhuang Virtual Immersive Exhibition" （寻境敦煌虚拟漫游沉浸展） via the WeChat mini-program, users can enter the online tour platform. By selecting the "Online Tour" （线上漫游） option, users can start the tour process, as shown in Figure 2.
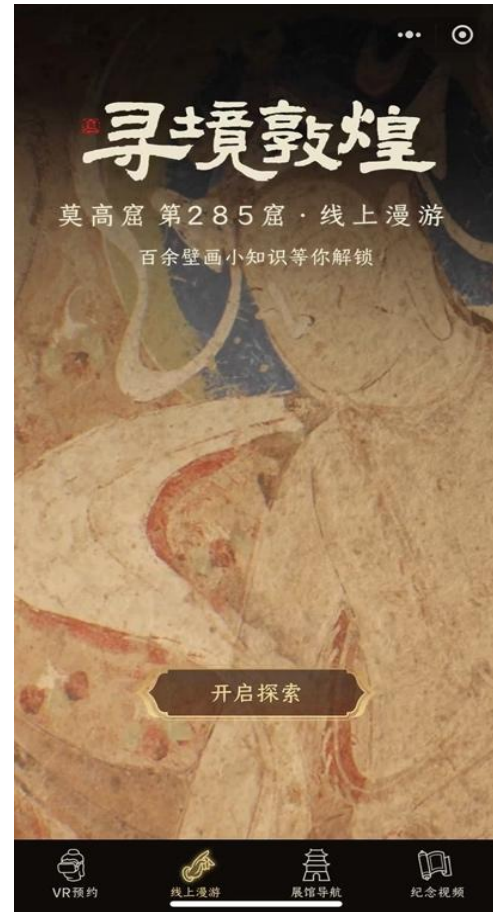
FIGURE 2. **The entrance of Mogao Cave No. 285**

Users can choose a specific attraction (e.g., "Mogao Cave No. 285") and begin the tour for that location, as shown in Figure 3. During the tour, users can experience a 360° immersive view of the attraction and zoom in to closely examine the details of the murals. The online exhibition also provides related commentary and plays soothing guzheng music as background, enhancing the immersive experience for visitors.

The presentation of the cave murals in the online tour is exceptionally realistic, allowing visitors to directly feel the visual impact of these artworks. Through this format, visitors can appreciate the magnificence of the Mogao Caves.

FIGURE 3. Mogao Cave No. 285 Tour process display diagram

Ⅳ. RESULTS

A. SAMPLE DEMOGRAPHIC ANALYSIS

692 responses were collected. After excluding samples with unusually short completion times and those with identical responses, 48 samples were removed. This resulted in 644 valid samples, with a validity rate of 93.1%. The characteristics of the valid samples are shown in Table 1.

TABLE 1.
Demographics profile of the sample (n=644)

Variable	Category	Frequency	%
Gender	Male	263	40.8
	Female	381	59.2
Age	< 18	1	0.2
	18-25	75	11.6
	26-35	284	44.1
	36-45	217	33.7
	46-55	67	10.4
	> 55	0	0
Salary (Yuan)	< 5000	157	24.4
	5000-8000	221	34.3
	8001-10000	115	17.9
	10001-15000	107	16.6
	> 15000	44	6.8

According to Table 1, regarding gender males account for 40.8% and females for 59.2%, indicating a higher proportion of females among the surveyed subjects. In terms of age groups, the main age ranges are 26 – 35 and 36 – 45. Concerning monthly income levels, the majority of the surveyed individuals fall within the income brackets of below 5000 yuan and 5000 – 8000 yuan, with the combined proportion of these two brackets approaching 60%.

B. CONFIRMATORY FACTOR ANALYSIS

The convergent validity of the scales is as follow.

Table 2.
Convergent Validity

Variables	Items	Factor Loading	CR	Cronbach's α	AVE
Cognitive Image	CI1	0.791			
	CI2	0.804			
	CI3	0.688	0.892	0.888	0.581
	CI4	0.834			
	CI5	0.756			
	CI6	0.687			
Affective Image	AI1	0.629			
	AI2	0.837			
	AI3	0.754	0.865	0.864	0.565
	AI4	0.784			
	AI5	0.737			
Overall Image	OI1	0.758			
	OI2	0.841	0.884	0.884	0.656
	OI3	0.807			
	OI4	0.832			
Immersive Experience	IE1	0.614			
	IE2	0.834			
	IE3	0.740	0.873	0.869	0.581
	IE4	0.837			
	IE5	0.764			
Satisfaction	SA1	0.660			
	SA2	0.825			
	SA3	0.639	0.853	0.851	0.541
	SA4	0.839			
	SA5	0.691			
Travel Intention	TI1	0.807			
	TI2	0.773			
	TI3	0.746	0.873	0.874	0.633
	TI4	0.852			

The results of the discriminant validity test are as follow:

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TABLE 3.
DISCRIMINANT VALIDITY

	Mean	S.D.	CI	AI	OI	IE	SA	TI
CI	4.584	1.125	**0.762**					
AI	4.581	1.157	0.542	**0.752**				
OI	4.537	1.320	0.562	0.538	**0.810**			
IE	4.616	1.175	0.595	0.493	0.640	**0.762**		
SA	4.604	1.186	0.616	0.571	0.658	0.682	**0.736**	
TI	4.642	1.175	0.477	0.416	0.487	0.512	0.514	**0.796**

From the results in Table 3 we can see that discriminant validity among the variables meets the requirements [47].

B. STRUCTURAL MODEL ASSESSMENT

After reliability analysis and confirmatory factor analysis, it has been confirmed that the reliability and validity of the variables all meet the requirements, allowing for the construction of the structural equation model as shown in Figure 4.
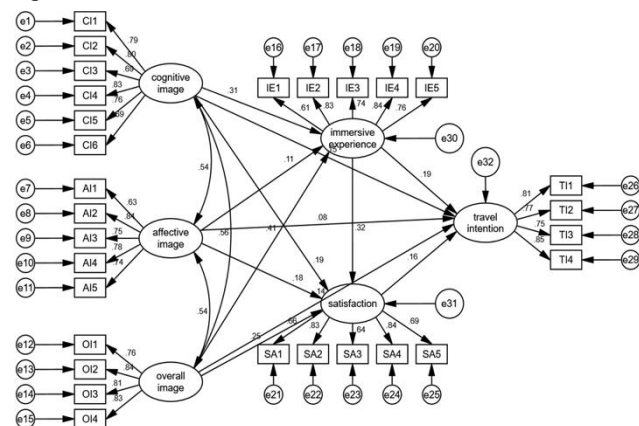

FIGURE 4. Results of structural equation model

IV. CONCLUSION AND IMPLICATIONS

A. CONCLUSION

1) THE DESTINATION IMAGE HELPS CREATE IMMERSIVE EXPERIENCE

The destination image has a significant and positive impact on IE during online museum visits, and the correlations among all three dimensions —CI, AI and OI—were tested and confirmed [48,49]. This indicates that when visitors perceive online exhibitions as well-organized, interactively engaging, and culturally rich, these positive cognitive images stimulate a higher level of immersive experience [50]. Similarly, if the online visit leaves a memorable and emotionally impactful impression, these positive emotional images also enhance the immersive experience [51]. Lastly, a strong overall image of the museum and a high level of

TABLE 4.
MODEL FIT

Index	Absolute Fit Index		Incremental Fit Index			Parsimonious Fit Index	
Classification	X²/df	RMSEA	IFI	TLI	CFI	PGFI	PNFI
Criteria	< 3	< 0.08	> 0.9	> 0.9	> 0.9	> 0.5	> 0.5
Value	2.718	0.052	0.943	0.936	0.943	0.759	0.814

From Table 4, we can see that all indicators meet the respective model fit criteria. Based on this, further path analysis was conducted, and the results are shown in Table 5.

TABLE 5.
STRUCTURAL EQUATION MODEL ASSESSMENT

H	Hypotheses			Estimate	S.E.	C.R.	P	β	Supported
H1	IE	<---	CI	0.250	0.040	6.184	***	0.250	Yes
H2	IE	<---	AI	0.108	0.047	2.280	*	0.108	Yes
H3	IE	<---	OI	0.309	0.040	7.761	***	0.309	Yes
H4	SA	<---	CI	0.159	0.040	3.989	***	0.159	Yes
H5	SA	<---	AI	0.188	0.047	3.952	***	0.188	Yes
H6	SA	<---	OI	0.198	0.040	5.005	***	0.198	Yes
H7	TI	<---	IE	0.260	0.086	3.017	**	0.260	Yes
H8	TI	<---	SA	0.210	0.089	2.366	*	0.210	Yes
H9	SA	<---	IE	0.338	0.056	6.062	***	0.338	Yes
H10	TI	<---	CI	0.163	0.062	2.633	**	0.163	Yes
H11	TI	<---	AI	0.110	0.073	1.505	0.132	0.110	No
H12	TI	<---	OI	0.140	0.062	2.255	*	0.140	Yes

(Note: *p < 0.05, **p < 0.01, ***p < 0.001)

visiting satisfaction contribute to a more immersive online experience [52,53].

2) THE DESTINATION IMAGE HELPS CREATE SATISFACTION

All three dimensions of the destination image significantly positively impacts SA during online visits [54,55]. That shows a well-presented exhibition with rich content, effective interaction, and cultural depth directly enhances visitor satisfaction [56]. Likewise, if the visit is enjoyable, stress-relieving, and leaves a lasting impression, these positive emotional images also boost satisfaction levels [57]. Furthermore, a positive overall experience, where visitors feel the museum is a high-quality destination worth revisiting, also improves satisfaction [58].

3) IMMERSIVE EXPERIENCE, SATISFACTION, AND TRAVEL INTENTION

The IE during an online museum visit significantly boosts the intention to visit the actual site [59,60]. A deep and engaging online experience keeps visitors focused and engrossed, often leading to a sense of lost time. Such engagement stimulates curiosity and exploration, increasing the likelihood of visiting the physical museum [61]. Additionally, high satisfaction from the online visit, especially if it meets expectations and encourages visitors to recommend the museum to others, further strengthens their interest in the actual site [62]. Finally, the IE during online visits enhances visitor satisfaction, which contributes to a higher intention to visit the physical site [63].

4) THREE DIMENSIONS OF DESTINATION IMAGE INFLUENCE TRAVEL INTENTION DIFFERENTLY

Among the three dimensions of the destination image, two dimensions stimulate the intention to visit the actual site [64,65]. The study shows that a positive CI, such as well-planned exhibits and high service levels, directly stimulates the intention to visit the physical site [66]. Similarly, a positive OI also encourages site visitation intentions. However, the AI does not have a significant impact on the TI, suggesting that even if the online experience is enjoyable and emotionally impactful, it does not directly influence visitor's intention to visit the physical museum [67].

The lack of a significant correlation between AI and TI is the only unsupported hypothesis in this study. This finding aligns with research by Castro et al (2007), and Zhang et al. (2014), which also found that AI does not significantly affect post-visit behavioral intentions [68,69]. This result may be due to the brief nature of online visits, which may not elicit deep emotional responses or resonances quickly. Visitors' perceptions may remain at a relatively superficial cognitive and overall level, making it challenging to generate a profound emotional experience that influences travel intentions [70]. However, the data still show that the limited AI generated during the visit can still directly enhance visitors' IE and SA, both of which directly influence the intention to visit the physical site.

B. IMPLICATIONS

The theoretical implications of this study can be reflected on two levels. First, many previous studies have explored the role of immersive experiences in shaping destination images. However, there is a lack of research analyzing from the opposite direction, specifically examining the impact of destination images during online visits on tourists' immersive experiences and visit satisfaction. Based on this gap, this paper examines the role of immersive experiences in the relationship between destination images and tourists' intentions to visit in person. The results show that the three dimensions of destination images all have a positive effect on eliciting tourists' immersive experiences, and each dimension contributes to building tourist satisfaction, which constitutes a positive incentive pathway. This study also directly examines the relationship between destination images and tourists' intentions to visit in person, revealing that AI does not stimulate tourists' intention to visit. This research provides a new sample for such studies, offering theoretical references for future related research.

Second, the findings from the 12 proposed hypotheses indicate that while the hypothesis suggesting a positive effect of AI on TI was not supported, all other hypotheses were validated. This suggests that during online tours, the influence of AI on visitors' TI requires a certain mediating mechanism. This mediation could occur through the activation of immersive experiences, which subsequently trigger visitors' intention to visit in person, or through enhancing visitors' satisfaction, which then leads to an intention to visit. However, AI alone cannot directly stimulate visitors' intention to visit in person. This is an intriguing finding and provides a valuable theoretical perspective for further in-depth exploration in future research.

From a practical standpoint, the results provide guidance for the development of online tour platforms and enhancing visitor experiences. The key practical implications are:

1) BUILDING A STRONG COGNITIVE IMAGE

When constructing online tour platforms, it is crucial to focus on establishing a positive CI of the attractions and exhibits. The online tour should showcase a diverse range of exhibits, optimize the layout and presentation of these exhibits, and provide timely and effective feedback to visitor inquiries or suggestions. These factors contribute to a positive CI of the online tour, which not only stimulates the intention to visit the physical site but also enhances the IE and SA of visitors [71]. Both of these aspects can further encourage the desire to visit the physical location.

The emergence of online museums is a product of technological development, and making full use of relevant technologies can directly enhance CI. For instance, in the case of the Dunhuang Academy's online museum, there is currently limited information provided for each cave regarding the murals. For visitors who lack extensive knowledge of history and culture, understanding and appreciating these works, which possess profound historical and cultural significance, can be quite challenging.

Future developers of online museums should pay close attention to this issue. They could conduct in-depth interpretations of each cave (or each exhibit in the case of other museums), highlighting a few representative knowledge points or key appreciation aspects for deeper

exploration and providing relevant explanations. Visitors could not only zoom in on the artworks via the screen to observe details closely but also access related information about these pieces. This would greatly enhance visitors' understanding and experience, contributing to the construction of positive CI and, in turn, increasing their intention to visit the site in person.

2) ENHANCING THE OVERALL IMAGE

It is also important to build a strong OI of the online tour platform. For online museums, this involves highlighting the characteristics and cultural significance of the exhibits, helping visitors develop a sense of connection with the museum during the online visit. This positive experience can boost the intention to visit the physical site and enhance visitors' sense of IE and SA [72]. These positive feelings, in turn, further promote the intention to visit the actual location.

The OI of an online museum can directly determine visitors' touring experience, and building this image requires online platform developers to enhance the overall quality of the platform. On the one hand, the platform's operation needs to be smoother, ideally offering visitors a variety of options. For example, visitors should be able to intuitively access exhibition information via a menu bar, including details about the exhibits, their categorization (by different time period, different types, features, etc.), and recommended tour paths. On the other hand, constructing the overall platform image should focus on enhancing visitors' IE. This can include adding appropriate background music and increasing visitor interaction (such as providing more options to like, comment, or leave feedback). These features can not only enhance the visitors' sense of engagement but also provide valuable insights into which parts of the platform are most favored, offering suggestions for further optimization. Currently, many online platforms have yet to fully implement these details, which is a key direction for improving the OI of online platforms in the future.

3) OPTIMIZING EMOTIONAL APPEAL

Although the hypothesis regarding the AI and its correlation with the intention to visit the physical site was not supported, it does not diminish the importance of building a positive AI. Instead, efforts should focus on optimizing the selection, display, and presentation of exhibits, enriching digital interactions during online visits, and quickly evoking emotional resonance within the limited time of the visit. A positive AI can contribute to a stronger IE and higher SA, which can directly influence the intention to visit the physical site [73].

A positive AI plays a significant role in building visitors' IE and enhancing their SA during online tours. In the process of establishing it, developers need to adopt the perspective of

visitors and understand their emotional needs during the tour. This provides an opportunity to offer visitors more diverse options. For instance, visitors could be allowed to choose the type of background music or the style of narration based on their preferences. At the same time, developers should create an engaging experiential environment tailored to the characteristics of the exhibits. This can include thoughtful light and shadow arrangements to highlight key aspects of the exhibits that evoke cultural resonance and showcase artistic mastery, such as colors, textures, and materials. By magnifying these critical details, the online tour can provide visitors with a more memorable emotional experience. If online platforms can achieve this level of design and execution, they will effectively establish a positive AI for online museums. This represents a promising direction for future development as museums strive to enhance their online platforms.

These practical insights provide actionable guidance for enhancing online tour platforms and improving visitor experiences, ultimately supporting the goal of increasing physical site visits.

C. LIMITATIONS AND FUTURE RESEARCH

There are some limitations and areas for improvement of this study, which are outlined as follows:

1) CASE STUDY LIMITATION:

The research uses the Dunhuang Research Academy as a case study. As one of China's most representative museums with significant cultural and historical value, the Dunhuang Museum has advanced early in the development of online museums and has a well-established platform. However, the visitor experiences and post-visit behavioral intentions generated by this online museum may not be fully representative of those on other online platforms.

Future research in this area will continue to expand, addressing the limitations identified in this study through the following improvements. First, expanding the sample size and incorporating multiple cases for comparative analysis will enhance the generalizability and applicability of the results. For example, in addition to studying the Dunhuang Academy, a supplementary case such as the Palace Museum's online museum could be introduced for horizontal comparison. A multiple-case study approach can validate the applicability of theories across different contexts or conditions, leading to conclusions with higher practical value. Second, a mixed-methods approach, combining quantitative and qualitative analysis, can be explored. On the basis of this study, additional interview surveys could be conducted to analyze how users' online experiences influence their intention to visit in person. This not only serves as a

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supplement but also helps verify the generalizability of the quantitative results, thereby enhancing the practical significance of the study's conclusions.

2) LACK OF ANALYSIS OF DEMOGRAPHIC FACTORS:

The study does not further analyze how individual factors such as age, gender and income levels affect online visiting experiences. These demographic factors might have significant impacts on individual online visitation experiences, but the study did not delve into these aspects.

With the rapid development of technology, especially VR, AR, metaverse technology and other advancements, the creation of online tour platforms by various attractions worldwide is becoming an inevitable trend. Online tours are expected to gain higher acceptance and widespread use. In this context, future research will likely become more numerous, in-depth, and targeted, with a closer connection to actual attractions [74]. The results of such research could provide valuable suggestions for optimizing online tour platforms and advancing the tourism industry, ultimately contributing to a more vibrant tourism economy and demonstrating the inherent value of this research.

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Wei Sun Sun was born in Shandong, China in June 1994 and obtained his Ph.D. in Design from Hanyang University in South Korea in 2024. He is currently the executive editor of the academic journals "Art & Design Research" and "Communication & Education Review." He is also a member of the Korean Brand Design Association and the Design Culture Association.

Dr. Sun is an assistant professor at Shandong Youth University of Political Science, focusing on research areas such as sustainable design, intelligent design, and brand design. Several of his papers have been indexed by SCI and EI retrieval systems.

Liwei Li Li was born in Sichuan, China, in March 1996. She is currently pursuing a Ph.D. in Visual Communication Design at Hanyang University in Seoul, South Korea. Her main research areas are packaging design and service design.

In 2023, she published two papers: A Study on Packaging Design Proposal for Jianlibao Sports Drinks to Meet Emotional Needs - Focusing on the Chinese MZ Generation (2023) and Directions for Improving the Service Experience for the Visually Impaired in Public Libraries: Focusing on the Utilization of Service Blueprint (2023). Her current and previous research interests include packaging design and service design.

Li is a member of the Brand Design Association of Korea and the Korea Institute of Design Research Society.

YIDONG LIU Liu was born in Shanghai, China, in December 1998. He is currently pursuing a PH.D.in Visual Communication Design at Hanyang University in Seoul, South Korea. His main research interests are User Experience Studies in Cultural Heritage Tourism and Consumer Sustainable Behavior Research.

In 2024, he published two papers: Exploring Users' Adoption Intention of Virtual Try-On Apps: How Users' Individual Characteristics Affect Post-Use Feelings and Modeling and Analysis of Visual Preference in Edible Oil Packaged Digging. His current and previous research interests include areas such as consumer behavior research.

Dr. Liu is currently a reviewer for the journals Art & Design Reserch and Asia Pacific Journal of Marketing and Logistics. He has published several academic papers in SCI and EI academic journals. He has won many awards in Chinese design competitions in the field of design.

Sun Fengyuan Sun was born in 1995 in Shandong Province, China. Obtained a master's degree in art and design from Qingdao University of Science and Technology in 2025, with a research focus on visual design and digital art.

She is currently working in e-commerce design in Qingdao, Shandong Province. At present, the main focus is on the multi-sensory presentation of vision, based on art theory and combined with the development and innovation of digital media technology, emphasizing the immersive and interactive design from the perspective of the viewer.

Ms. Sun is currently a member of the Qingdao Handicraft Association and has won national second and third prizes in the "China creative challenges contest". She has also won relevant awards multiple times in the "China Creative Packaging Design Award".

Ya Zhu. Zhu was born in Shaoxing in 1998, Zhejiang Province. She received a bachelor's degree in musicology from Lishui University in 2020. In 2021, she became a graduate student of bel Canto in vocal music Performing Arts of Guangxi University of the Arts, and successfully graduated in 2024.

She published journal papers in Art & Design Research Vol. 5 Lss. 2 2024.Personal research direction is vocal performance art, Bel Canto direction.