The Effect of Virtual Reality Museum Experience on Visit Intention in the Context of Flow Theory: The Role of Hedonic and Utilitarian Values

O Efeito da Experiência de Museu em Realidade Virtual na Intenção de Visita no Contexto da Teoria do Flow: O Papel dos Valores Hedónicos e Utilitários

Osman Nurullah Berk
Selçuk University, Beyşehir Ali Akkanat Faculty of Management, Business Administration, Türkiye, osman.berk@selcuk.edu.tr

Engin Tengilimoğlu
Selçuk University, Beyşehir Ali Akkanat Faculty of Tourism, Tourism Management, Türkiye, entengilimoglu@selcuk.edu.tr

Emel Celep
Selçuk University, Faculty of Economics and Administrative Sciences, Business Administration, Türkiye, ecelep@selcuk.edu.tr

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Abstract

Recently, there has been growing interest in virtual reality as an effective technology and marketing tool that allows individuals to experience museum exhibits in an interactive, immersive way. This study examines the impact of VR videos designed for museums on visit intentions, using flow theory and dual-path hedonic and utilitarian value, via a structural equation model. After watching the VR video designed for the Dolmabahçe Palace Museum, participants were asked to complete a questionnaire measuring their perceptions, attitudes and intentions. The results indicate that flow experience dimensions have a positive effect on both hedonic and utilitarian values, which, in turn, affect satisfaction and offline visit intention. It has been found that telepresence is more effective at enhancing hedonic value, while focused attention is more effective at enhancing utilitarian value. Furthermore, the hedonic value has a greater effect on satisfaction. In conclusion, VR videos designed for museums can help them attract more visitors.

Keywords: Virtual Reality (VR), Museum, Flow Theory, Hedonic Value, Utilitarian Value, Cultural Heritage.

Resumo

Recentemente, tem havido um interesse crescente pela realidade virtual (RV) como uma tecnologia eficaz e ferramenta de marketing que permite aos indivíduos experienciar exposições em museus de forma interativa e imersiva. Este estudo examina o impacto dos vídeos de RV concebidos para museus nas intenções de visita no contexto da teoria do flow e do valor hedónico e utilitário de caminho duplo através do modelo de equações estruturais. Depois de assistirem ao vídeo de RV concebido para o Museu do Palácio Dolmabahçe, os participantes foram convidados a preencher um questionário que media as suas perceções, atitudes e intenções. Os resultados indicam que as dimensões da experiência de flow têm um efeito positivo nos valores hedónicos e utilitários, que por sua vez afetam a satisfação e a intenção de visita física. Verificou-se que a telepresença é mais eficaz no aumento do valor hedónico, enquanto a atenção focada é mais eficaz no aumento do valor utilitário. Além disso, o valor hedónico tem um efeito maior na satisfação. Em conclusão, os vídeos de RV concebidos para museus podem ajudá-los a atrair mais visitantes.

Palavras-chave: Realidade Virtual (RV), Museu, Teoria do Flow, Valor Hedónico, Valor Utilitarista, Património Cultural.

1. Introduction

In recent years, there have been significant advances in integrating technology into tourism. One such innovation is virtual reality (VR), which has emerged as a prominent technological advancement offering new perspectives on various aspects of tourism, including planning, marketing, management, education, entertainment, accessibility, heritage preservation, and sustainability (Guttentag, 2010; Lee & Kim, 2021). These new perspectives that VR introduces to the field of tourism originate from its ability to merge real-world elements with digital content, thereby offering unique and immersive experiences (Li, Nie & Ye, 2022). The tourism industry now offers visitors, researchers, and practitioners a unique VR experience (González-Rodríguez, Díaz-Fernández & Pino-Mejías, 2020).

VR is a concept that refers to a specific technological system and has been defined in various ways by different authors in the literature (Guttentag, 2010; Radianti et al., 2020; Liberatore & Wagner, 2021), each emphasising different aspects. A comprehensive and commonly accepted definition is provided by Guttentag (2010) as follows: "the use of a computer-generated virtual environment that one can navigate and potentially interact with, resulting in real-time stimulation of one or more of the user's five senses". VR provides a simulated experience that evokes realistic sensations and makes the user feel as if they are present in the virtual environment (Violante, Vezzetti & Piazzolla, 2019). By using advanced hardware, such as headsets and motion-tracking devices, VR immerses users in artificial worlds where they can interact with digital objects and environments (Fang et al., 2017). Thanks to VR, tourists can experience attractions such as destinations, museums, historical landmarks, and natural beauties as if they were physically present.

The use of VR has become widespread in recent years thanks to its low production costs, the ability for individuals to turn their smartphones into VR devices with the help of wearable glasses, and the growing number of alternatives (Van Kerrebroeck, 2017).

The implementation of travel bans in response to the Covid-19 pandemic prompted individuals to explore alternative travel options, which, in turn, led to the widespread adoption of VR for tourism (Cecilia 2021; Talwar et al., 2022). With the development of a wealth of tourism-related VR content, the adoption process has been made more straightforward (Kang, 2020).

In the context of tourism, VR can be used to stimulate interest in a destination or attraction before a visit, enhance the tourist experience during the visit, and recall or relive the experience after the visit (Tussyadiah et al. 2018; Nam, Baker & Dutt, 2024). Correspondingly, studies on VR generally focus on two distinct time points: before the visit (pre-visit) and during the visit (on-site). While on-site studies focus on revisit and recommendation intentions (Wei, Qi & Zhang, 2019; Genc et al., 2023), pre-visit studies focus on offline visit intentions (Li & Chen, 2019). Due to the intangible nature of tourism, it is an experiential product that tourists can only experience by actually visiting the destination (Lee, Jeong & Qu, 2020). Thus, VR has received considerable attention as a new marketing tool that offers tourists trial experiences to help them reduce uncertainty by providing rich, immersive information (An, Choi, & Lee, 2021). According to research conducted by Tourism Australia (2024), nearly 20% of travellers have used VR to choose a destination. Around 25% of travellers indicated that they plan to use VR in the future to help them decide on a destination. Furthermore, according to research conducted in Germany, nearly 50% of travellers would use VR to choose their destination (ImmersionVR, 2024).

Recently, marketers have increasingly used VR to encourage users to explore and experience marketing stimuli before making purchase decisions (Lee & Kim, 2021). Despite its widespread use and potential impact, VR studies remain limited, especially in the marketing context (An et al., 2021). Moreover, it is evident that the findings of limited studies are inconsistent. For instance, Deng, Unnava, and Lee (2019) found that experiencing a tourist destination through VR negatively affected tourists' intention to visit the destination in real life. In contrast, numerous pre-visit VR studies have shown that VR has a positive effect on actual visit intentions (Lee & Kim, 2021; Yung, Khoo-Lattimore & Potter, 2021; An et al., 2021; Genc et al., 2023). This divergence in empirical findings highlights a significant theoretical debate over the mechanisms underlying VR effectiveness and underscores the need for a robust explanatory model. Researchers claim that most VR studies lack a theoretical framework and are insufficiently studied (Wei, 2019). In other words, research on VR is still in its early stages (Lee et al., 2020). Yung and Khoo-Lattimore (2019), in their systematic review of VR, highlighted a research gap in the adoption of theory-based approaches to understanding user experience. To resolve this theoretical inconsistency and provide explanatory power for the mechanisms linking VR use to visit intention, this study adopts Flow Theory and the dual-path model of hedonic and utilitarian values to explore users' VR experiences. Museum experience with VR basically refers to technology-human interaction (Yang & Zhang, 2022). Flow theory provides a useful theoretical framework for understanding users' perceptions, attitudes, and behaviours in the context of technology-human interaction (Ozkara, Ozmen & Kim, 2017; Kim et al., 2020; Barta, Gurrea & Flavián, 2023). VR provides multisensory and interactive engagements that generate a strong sense of presence, facilitate temporal and spatial displacement for users, and enhance affective connections with content (Li et al., 2023), thereby enhancing the flow experience (Lee & Kim, 2021). Thus, determining the role of VR in marketing includes flow as a key component of the user experience and a predictor of subsequent behaviour (An et al., 2021).

In tourism-related studies, flow is often treated as a unidimensional construct (Tengilimoglu & Hassan, 2020; Lee & Kim, 2021; Rodrıguez-Ardura et al., 2024), leading to inconsistent findings regarding its effects on hedonic and utilitarian value. However, no study has yet examined the effect of flow sub-dimensions separately. This is crucial because each dimension of flow is differentially associated with different outcomes (Lee & Wu, 2017; An et al., 2021). This research contributes a novel conceptual advance by adopting a multidimensional view of flow (Telepresence, Focused Attention, and Temporal Distortion) and integrating it directly as an antecedent to the dual-path model of hedonic and utilitarian values. By analysing the differential impact of each specific flow dimension on both hedonic and utilitarian values, we provide a fine-grained explanation for the mixed findings in previous VR research, where flow has been inconsistently linked to value perceptions (e.g., Senecal, Gharbi & Nantel, 2002; Lee & Kim, 2021). Therefore, to fully understand the VR experience and its impact on attitudes and behaviours, it is more appropriate to consider flow multi-dimensionally (An et al., 2021). Moreover, it is noted that although some conceptual and theoretical foundations exist, there is a lack of research on users' hedonic or utilitarian perceptions of the VR experience (Nam et al., 2024). In this regard, utilising dual-path hedonic and utilitarian values as the main predictors of VR users' subsequent behaviour can be considered an important contribution to the literature.

This study investigates the effect of a pre-visit VR museum experience on visit intention, in the context of flow theory and dual-path hedonic and utilitarian values. In this regard, it differs from existing research in the literature in several ways. Firstly, it focuses on dual-path hedonic and utilitarian values in the context of VR, which has been identified as a relatively neglected topic in the existing literature. Secondly, by conceptualising flow as a multidimensional construct, it offers an explanation for the inconsistent findings regarding the relationship between flow and dual-path hedonic and utilitarian values across contexts. Lastly, it focuses on VR museum marketing, which has been neglected in VR studies.

2. Research Model and Hypotheses Development

2.1 *Flow Theory as an Antecedent of Hedonic and Utilitarian Values*

The use of VR in museums represents a significant advancement in the interaction between technology and human experience (Li et al., 2023). Flow theory, which is commonly used in technology-human interaction research, provides a comprehensive framework for understanding users' perceptions, attitudes, and behaviours. (Koufaris, 2002; Ozkara et al., 2017; Kim et al., 2020; Barta et al., 2023; Rodrıguez-Ardura et al., 2024). Flow has been described as either a holistic sensation that people feel when they act with total involvement (Csikszentmihalyi, 1975), a psychological state of immense pleasure (Rodrıguez-Ardura et al., 2024), and an extremely pleasurable experience (Ozkara et al., 2017). In the context of VR, flow experience is the complete mental involvement and enjoyment that accompanies the loss of time and space (Lee & Kim, 2021). Flow theory offers a strong framework for explaining the enjoyment derived from using digital media, emphasising its importance for understanding user behaviour in museum contexts enhanced by virtual reality (Rodrıguez-Ardura et al., 2024).

Despite its widespread use, the literature has long debated how to construct flow, and uncertainty about the topic persists (Hoffman & Novak, 2009; Ozkara et al., 2017). Although flow is often considered a unidimensional construct in tourism studies (Kim & Hall, 2019; Zhang & Rahman, 2022; Rodrıguez-Ardura et al., 2024), this simplification fails to capture the unique psychological dynamics of highly immersive environments such as VR. Given that VR is designed to specifically manipulate a user's sense of place, time, and attention, a multidimensional conceptualisation is theoretically indispensable. Therefore, consistent with An et al. (2021) and the nature of VR, we treat flow theory as consisting of three distinct dimensions: telepresence, focused attention, and temporal distortion. Telepresence is a media-based experience that enables users to feel as though they are in a virtual environment beyond their immediate physical surroundings through a communication channel (Han et al., 2020). The sub-dimension that measures attention during virtual activities is referred to as focused attention (Koufaris, 2002). When an individual is immersed in a VR experience, they become disconnected from their surroundings and focus their attention on the virtual environment (An et al., 2021). Temporal distortion refers to the extent to which an individual loses track of real time while participating in a VR experience. During the state of flow, individuals may have an inaccurate sense of time and perceive time as passing more quickly than usual (An et al., 2021).

Flow experience is often used as an independent (Lee & Kim, 2021) or mediating (An et al., 2021; Zhang & Rahman, 2022; Rodriguez-Ardura et al., 2024; Ozkan et. al., 2024) variable in research on VR. It is obvious that VR, with its interactive and immersive characteristics, provides a flow experience for users (Lee & Kim, 2021). This study considers flow as an independent variable and focuses on its outcomes rather than its antecedents. It is predicted that flow experience plays a crucial role in VR-supported museum applications (Wang et al., 2023) and can provide visitors with an unforgettable experience (Wei, 2019). The literature emphasises the significance of customer experiences in shaping value (Ryu, Han & Jang, 2010; Nam et al., 2024). Service dominant logic suggests that value is created through customer experiences rather than being inherent in products or services (Rodrıguez-Ardura et al., 2024). In this sense, flow as an extremely pleasurable experience (Ozkara et al., 2017) is likely to enhance value for users in the context of VR. Studies have identified two primary forms of value: hedonic and utilitarian (Prebensen & Rosengren, 2017; Lee & Kim, 2021; Vieira, Rafael & Agnihotri, 2022). The relationship between flow and dual-path hedonic and utilitarian value was first tested by Senecal et al. (2002). They found that flow experience has a positive effect on hedonic value but no effect on utilitarian value. However, previous research has shown that flow experiences affect both hedonic and utilitarian values in various contexts, including VR (Lee & Wu, 2017; Kim & Thapa, 2018; Lee & Kim, 2021; Rodrıguez-Ardura et al., 2024). This conflicting evidence suggests that treating flow as a single construct obscures the underlying psychological pathways. To resolve this theoretical ambiguity, we use a multidimensional conceptualisation of flow to test the distinct influence of each component. Building on prior research and strong theoretical support from service dominant logic, we propose that, in the context of VR, the components of the flow experience positively affect dual path utilitarian and hedonic values.

H_1: Flow experience positively affects hedonic value.

H_{1a}: Telepresence positively affects hedonic value.

$H_{1b:}$ Focused attention positively affects Hedonic value.

H_{1c}: Temporal distortion positively affects Hedonic value.

H_2: Flow experience positively affects utilitarian value.

$H_{2a:}$ Telepresence positively affects utilitarian value.

$H_{2b:}$ Focused attention positively affects utilitarian value.

$H_{2c:}$ Temporal distortion positively affects utilitarian value.

2.2 *Hedonic, Utilitarian Value and Satisfaction*

Fischer and Arnold (1990) suggest that individuals often develop two values of their experiences: a hedonic and a utilitarian one. Although some researchers claim that museums are hedonic-dominant services (Prebensen & Rosengren, 2017; Komarac & Ozretić Došen, 2022), the prevailing view is that museums are both hedonic and utilitarian (Hyun et al., 2018). While its subjectivity and personal nature characterise hedonic value, including elements such as fun and playfulness (Babin et al., 1994), utilitarian value is typically functional, instrumental, and cognitive (Hanzaee & Rezaeyeh, 2013). In the context of museums, hedonic value refers to the enjoyment, aesthetic satisfaction, or fulfilment visitors experience when engaging with works of art, historical objects, or exhibitions (Komarac & Ozretić Došen, 2022). Utilitarian value, on the other hand, is related to education, learning, research, and information (Hyun et al., 2018).

Among the various dimensions of value (Kim & Thapa, 2018; Serravalle et al., 2019), hedonic and utilitarian values are the most commonly used in recent marketing literature (Hanzaee & Rezaeyeh, 2013; Vieira et al., 2022; Nam et al., 2024; Nugraha & Susanto, 2025). Hedonic and utilitarian values are considered to be the main determinants of customer attitudes, and subsequent behaviour in various contexts including VR (Babin et al., 1994; Ryu et al., 2010; Hanzaee & Rezaeyeh, 2013; Lee & Wu, 2017; Vieira et al., 2022; Deng et al., 2023; Rodriguez - Ardura et al., 2024; Nam et al., 2024). Moreover, in studies on VR and various contexts, it is clear that hedonic and utilitarian values affect customers' attitudes (Vieira et al., 2022) and satisfaction (Ryu et al., 2010; Lee & Wu, 2017; Nam et al., 2024). Therefore, it is hypothesised that hedonic and utilitarian values and satisfaction are closely related. Based on the literature reviewed, the following hypotheses have been proposed.

H_3: Hedonic value positively affects VR satisfaction.

H_4: Utilitarian value positively affects VR satisfaction.

2.3. Satisfaction and Visit Intention

Positive experiences lead to satisfaction, which in turn influences behavioural intentions, particularly revisit intentions (Hyun et al., 2018; Zouair et. al., 2025), in various contexts such as restaurants (Hanzaee & Rezaeyeh, 2013; Lee & Wu, 2017), destinations (Kim & Thapa, 2018; Soares et. al., 2025), and festivals (Tom Dieck et al., 2018). Revisit intention is a cognitive state that reflects a visitor's plan to return to a destination within a predicted period of time (Weaver & Lawton, 2011). VR has enabled people to get a sense of a destination or a museum online without having to make a physical visit (Wang et al., 2009). This situation offers a different perspective on the revisit phenomenon and has led to the emergence of the concept of the offline visit. An offline visit is physically visiting an attraction that has been experienced through VR. Previous pre-visit VR studies have shown that satisfaction with VR experiences can affect offline visit intentions in both destinations (An et al., 2021) and museums (Lee et al., 2020). In a meta-analysis of augmented reality (AR), Vieira et al. (2022) concluded that satisfaction also affects behavioural intentions. Additionally, Zhang & Rahman (2022) found that satisfaction with VR museum experiences can impact visitor loyalty. This study aims to assess visitors' intention to return to the museum after experiencing it via VR. The hypothesis is formulated as follows, based on relevant studies:

H_5: VR satisfaction positively affects offline visit intention.

3. Methodology

3.1. *Data Collection*

The purpose of this study is to investigate the impacts of VR simulation on the intention to visit a museum. For this purpose, the participants were shown a VR simulation of Dolmabahçe Palace provided by T.C. National Palaces. Dolmabahçe Palace, the final residence of the Ottoman Rulers, located in the Beşiktaş district of Istanbul, Türkiye, on the European coast of the Bosporus Strait, served as the main administrative centre of the Ottoman Empire from 1856 to 1887 and from 1909 to 1922 (Ministry of Culture & Tourism, 2023). The Dolmabahçe Palace Museum was specifically selected for this study due to its high profile and broad appeal, attracting 1.5 million visitors in 2022. This popularity suggests it is perceived as a significant cultural heritage site, balancing both historical/educational (utilitarian) value and architectural/aesthetic (hedonic) value, making it an ideal context to test our dual-path value model. Furthermore, the availability of a high-quality, non-interactive, 360-degree VR simulation of this well-known site allowed us to isolate the effect of the immersive viewing experience on flow, value, and intention, providing a strong baseline for this phase of research.

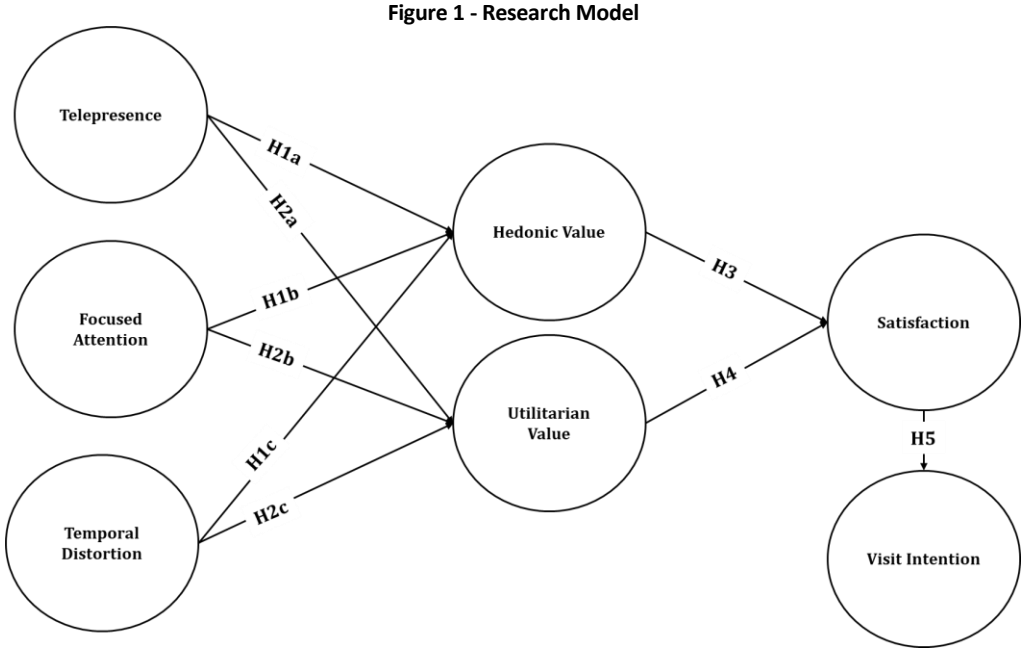
The 11-minute VR Simulation used in the palace consists of the Gate of the Treasury, Gate of the Sultan, Medhal Hall, Crystal Staircase, Muayede Saloon, Hünkar Has Room (harem and selamlık), Blue Hall, Atatürk's Room, Bird Garden, Clock Museum, and Palace Collections Museum. The VR video shown to participants consists of 360-degree panoramic real scenes and narration of the relevant areas, accompanied by acoustic music, with no interaction. After experiencing the Dolmabahçe Palace via VR on the Oculus Quest 2, participants completed a questionnaire designed to measure their experience with VR simulation face-to-face.

The use of a non-interactive, 360-degree panoramic VR video was a deliberate methodological choice. While fully interactive VR provides the highest level of immersion, a high-quality, non-interactive video allows us to isolate the core effect of visual presence and focused attention on value perception, without confounding variables associated with complex user interface and interaction design. This fixed-path viewing experience ensures that all participants were exposed to the exact same stimulus, which is crucial for testing the differential impact of the Telepresence and Focused Attention dimensions of flow.

The data were collected from visitors to the Eşrefoğlu Mosque, which was inscribed on UNESCO's World Heritage List in 2023. After their visit, participants were asked if they would like to experience the Dolmabahçe Palace through VR. Those who volunteered were included in the study, and 226 participants were reached. While this sampling strategy narrows the focus to individuals already expressing an interest in heritage and cultural tourism, it inherently introduces a potential selection bias related to high inherent interest and general cultural curiosity. However, this targeted sampling was adopted to ensure a relevant study population for testing pre-visit marketing impact, as individuals with zero interest in heritage would be unlikely targets for such marketing efforts. Importantly, the survey also confirmed prior offline visit history: the majority of participants (80.1%) had never visited the Dolmabahçe Palace, suggesting their pre-existing high interest was successfully isolated from familiarity with the target attraction itself, thereby validating the test of offline visit intention.

A structural equation model was developed (Figure 1) in the context of flow theory, dual-path utilitarian, and hedonic values to test the effect of VR on offline visit intention using Amos statistical software. It is recommended that the sample size in covariance-based structural equation models be at least 10 times the number of items in the measurement model (Hair et al., 2008; Byrne, 2016). The research questionnaire consists of 21 items, indicating that the minimum sample size requirement has been met with 226 participants.

Figure 1 - Research Model



Source: Own Elaboration.

3.2. *Questionnaire and Measurements*

In this study, a questionnaire was developed to collect data. All measures were adapted from existing scales in the relevant literature. Temporal distortion, telepresence, focus attention, and satisfaction scales were obtained from An et al. (2021). Hedonic and utilitarian value scales were obtained from Lee & Kim (2021). The visit intention scale was obtained from Lee et al. (2020). All construct measures were rated on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree.

Since the study was conducted in Turkey, the questionnaire required translation into Turkish. Back-translation was used to ensure the accuracy of the version. A thorough pre-test was conducted involving 30 respondents prior to the data collection stage. The method was found to have no major problems, and some minor issues were corrected through instruction changes.

3.3. *Reliability and Validity*

Cronbach's α and CR were used to assess the measurement reliability of the questionnaires. A confirmatory factor analysis was conducted for convergent validity and discriminant validity of the measures.

Table 1 - Construct Reliability and Validity Analysis

Construct	Items	Mean	SD	Skewness	Kurtosis	t-value	Factor Loading
Telepresence	Tel_1	3,721	,9127	-,374	-,136	-	0,814
AVE: 0,725	Tel_2	3,854	,9048	-,361	-,516	15,386	0,875
Composite Reliability: 0,887 **Cronbach's Alpha: 0,887**	Tel_3	4,040	,8450	-,611	,009	15,123	0,864
Focused Attention	Foc_1	3,739	,9924	-,475	-,324	-	0,873
AVE: 0,808	Foc_2	3,903	,8941	-,635	,134	19,867	0,919
Composite Reliability: 0,926 **Cronbach's Alpha: 0,923**	Foc_3	3,978	,9307	-,790	,183	19,234	0,903
Temporal Distortion	Td_1	3,655	1,0222	-,249	-,645	-	0,899
AVE: 0,815	Td_2	3,389	1,0279	-,070	-,714	20,035	0,896
Composite Reliability: 0,930 **Cronbach's Alpha: 0,930**	Td_3	3,465	1,0376	-,206	-,622	20,808	0,913
Hedonic Value	Hed_1	4,115	,8718	-,835	,287	-	0,883
AVE: 0,824	Hed_2	4,031	,9062	-,531	-,666	19,581	0,892
Composite Reliability: 0,934 **Cronbach's Alpha: 0,934**	Hed_3	4,186	,8899	-,870	-,082	22,333	0,948
Utilitarian Value	Uti_1	4,106	,8523	-,770	,247	-	0,841
AVE: 0,718	Uti_2	4,022	,7913	-,745	,777	15,346	0,861
Composite Reliability: 0,884 **Cronbach's Alpha: 0,882**	Uti_3	3,907	,8719	-,711	,601	14,832	0,839
Satisfaction	Sat_1	4,199	,7945	-,694	-,169	-	0,898
AVE: 0,735	Sat_2	4,119	,8213	-,710	,249	17,568	0,840
Composite Reliability: 0,892 **Cronbach's Alpha: 0,893**	Sat_3	3,965	,8157	-,777	,955	17,272	0,833
Visit Intention	Vis_1	3,996	,9452	-,724	,086	-	0,903
AVE: 0,812	Vis_2	3,938	,9168	-,680	,220	22,856	0,948
Composite Reliability: 0,928 **Cronbach's Alpha: 0,926**	Vis_3	3,805	,8729	-,379	-,108	18,299	0,850
Notes: X^2 = 252,602; d.f. = 168; X^2/d.f. = 1,504; GFI = 0,908; CFI = 0,981; NFI = 0,946; TLI = 0,976; RMSEA = 0,047							

Source: Survey's data.

Table 1 demonstrates the reliability of all measures as the composite reliability (CR) values exceeded the recommended level of 0.8 and the Cronbach's Alpha (CA) values exceeded 0.7 (Hair et al., 2008; Byrne, 2016). Additionally, the average variance extracted (AVE) values for all constructs exceeded the suggested threshold value of 0.50 (Hair et al., 2008; Byrne, 2016). Skewness and kurtosis values ranging from -1.5 to +1.5 indicate a normal distribution (Tabachnick & Fidell, 2007). Moreover, the fully standardised factor loadings were positive and statistically significant, demonstrating unidimensionality and convergent validity. The model (X2 = 252,602; d.f. = 168; X2/d.f. = 1,504; GFI = 0.908; CFI = 0.981; NFI = 0.946; TLI = 0.976; RMSEA = 0.047) has an acceptable measurement model fit (Hair et al., 2008; Byrne, 2016).

Table 2 - Discriminant Validity (Fornell-Larcker and HTMT)

Construct	Fornell-Larcker							Heterotrait-Monotrait Ratio (HTMT)					
	Tel	**FA**	**TD**	**HV**	**UV**	**Sat**	**VI**	**Tel**	**FA**	**TD**	**HV**	**UV**	**Sat**
Telepresence	**0,851**												
Focused Attention	0,716 *	**0,899**						0,718					
Temporal Distortion	0,640 *	0,664 *	**0,903**					0,643	0,677				
Hedonic Value	0,841 *	0,696 *	0,628 *	**0,908**				0,841	0,694	0,621			
Utilitarian Value	0,686 *	0,704 *	0,646 *	0,668 *	**0,847**			0,689	0,712	0,650	0,670		
Satisfaction	0,850 *	0,814 *	0,722 *	0,851 *	0,756 *	**0,857**		0,858	0,817	0,718	0,844	0,759	
Visit Intention	0,585 *	0,454 *	0,518 *	0,644 *	0,544 *	0,723 *	0,901	0,611	0,479	0,528	0,648	0,549	0,730

Tel: Telepresence**, FA:** Focus Attention**, TD:** Temporal Distortion**, HV:** Hedonic Value**, Sat:** Satisfaction**, VI:** Visit Intention**, *p<0,001**

Source: Survey's data.

4. Findings

The sociodemographic characteristics of the sample are shown in Table 3.

Table 1 - Demographic Findings

Item	Answer	N (226)	%
Gender	Female	70	31,9
	Male	154	68,1
Generation	Generation Z	142	62,8
	Generation Y	27	11,9
	Generation X	30	13,3
	Baby Boomers	27	11,9
Marital Status	Single	150	66,4
	Married	73	33,6
Education	Primary School	13	5,8
	High School	15	6,6
	University	155	68,6
	Postgraduate	43	19
VR Experience	Yes	55	24,3
	No	171	75,7
Offline Visit	Yes	45	19,9
	No	181	80,1

Source: Survey's data.

Table 3 shows that the majority of participants were male. In terms of generational breakdown, Generation Z has the highest participation rate. Single people make up the majority of those surveyed regarding marital status, and those with a university degree make up the majority of participants. Additionally, participants were asked about their VR experience and their visit to the Dolmabahçe Palace Museum. The results indicate that most participants have never experienced VR or visited the Dolmabahçe Palace Museum.

4.1. *Structural Model and Hypothesis Testing*

SEM was used to estimate the parameters of the structural model shown in Figure 1. The standardised solutions were calculated using the maximum likelihood method. All fit indices shown in Table 4 indicate a good fit (*X^2 = 302,755; d.f. = 177; X^2/d.f. = 1,710; GFI = 0,891; CFI = 0,972; NFI = 0,936; TLI = 0,967; RMSEA = 0,056*) (Hair et al., 2008; Byrne, 2016).

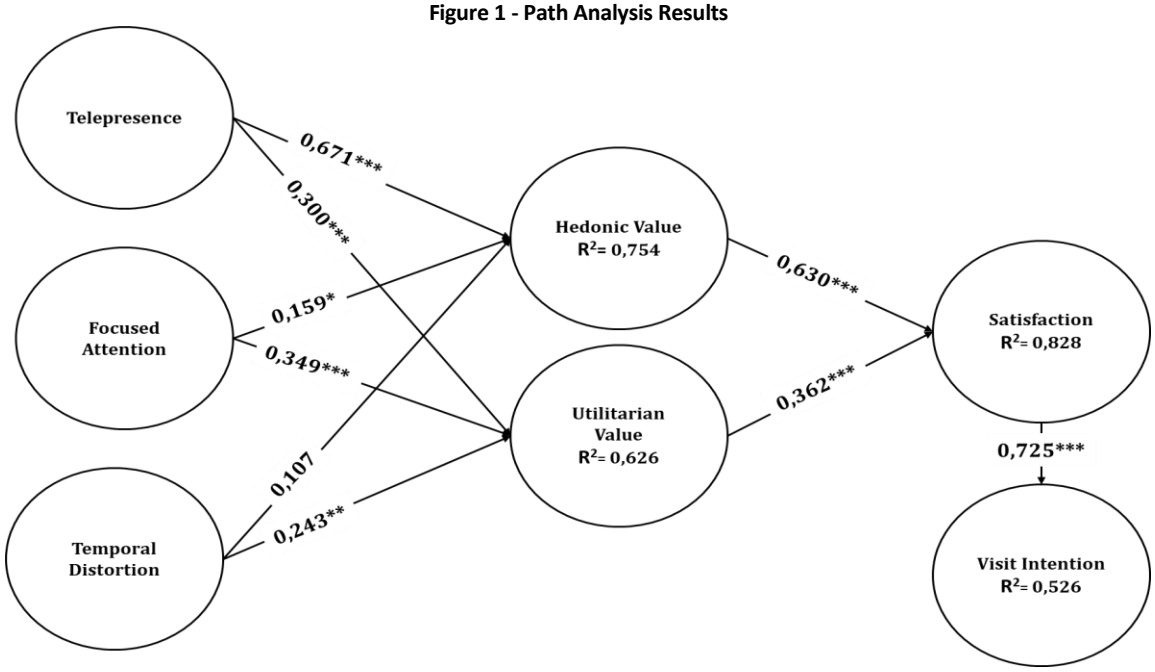
Table 2 - Results of Hypothesis Testing

Path	Std. Coef.	t-value	SE	P value	Results
H1a: Telepresence → Hedonic Value	0,671	8,251	0,084	0,000	Supported
H1b: Focus Attention → Hedonic Value	0,159	2,221	0,063	0,026	Supported
H1c: Temporal Distortion → Hedonic Value	0,107	1,717	0,052	0,086	Rejected
H2a: Telepresence → Utilitarian Value	0,300	3,494	0,083	0,000	Supported
H2b: Focus Attention → Utilitarian Value	0,349	4,012	0,071	0,000	Supported
H2c: Temporal Distortion → Utilitarian Value	0,243	3,199	0,058	0,001	Supported
H3: Hedonic Value → Satisfaction	0,630	10,233	0,057	0,000	Supported
H4: Utilitarian Value → Satisfaction	0,362	6,070	0,060	0,000	Supported
H5: Satisfaction → Visit Intention	0,725	11,877	0,073	0,000	Supported
Notes: X^2 =302,755; d.f. = 178; X^2/d.f. = 1,710; GFI = 0,891; CFI = 0,972; NFI = 0,936; TLI = 0,967; RMSEA = 0,056					

Source: Survey's data.

The results of the hypotheses, path coefficients, and significance levels are presented in Table 4. As expected, telepresence was shown to have a significantly positive effect on hedonic (β = 0,671) and utilitarian value (β = 0,300), thereby supporting H1a and H2a. Attention focus was shown to have a significantly positive effect on both hedonic (β = 0,159) and utilitarian value (β = 0,349), thereby supporting H1b and H2b. On the other hand, temporal distortion has no significant effect on hedonic value (β = 0.107, p = 0.086 > 0.05). However, it has a positive effect on utilitarian value (β = 0,243). Hence, H1c is rejected while H2c is supported. In addition, the results indicate a significantly positive influence of hedonic value (β = 0,630) and utilitarian value (β = 0,362) on satisfaction, thereby supporting H3 and H4. Finally, it is seen that satisfaction (β = 0,725) has a positive effect on visit intention. Thus, H5 is supported.

Figure 1 - Path Analysis Results



Source: Own Elaboration.

Telepresence is more effective on hedonic value (β = 0,671), whereas focus attention is more effective on utilitarian value (β = 0,349). These findings suggest that the telepresence dimension of the flow experience is more closely related to hedonic value,

whereas the focus-attention and temporal-distortion dimensions are more closely related to utilitarian value. Thus, flow experience provides both hedonic and utilitarian values to the users in the context of VR.

Hedonic value (β = 0,630), which is derived from the pleasure and enjoyment experienced (Lee & Wu, 2017), is more effective on satisfaction than utilitarian value (β = 0,362), which refers to the overall evaluation of the functional benefits (Hyun et al., 2018). Thus, in the context of VR in museums, hedonic aspects come to the forefront in terms of providing satisfaction with the VR experience.

The R^2 values in Figure 2 indicate the model's ability to explain the variance in the dependent variable. When evaluating R^2, a value of 0,67 or higher indicates a high level of explanation, while a value between 0,33 and 0,67 indicates a medium level, and a value between 0,29 and 0,33 indicates a weak level of explanation (Chin, 1998). According to relevant reference values, the model explains hedonic value (R^2 = 0,754) and satisfaction (R^2 = 0,828) at a high level and utilitarian value (R^2 = 0,626) and visit intention (R^2 = 0,526) at a medium level.

5. Conclusion and Discussion

VR, which has emerged with technological development, allows tourists to virtually visit destinations and other tourist attractions (Wang et al., 2009; Guttentag, 2010; Yung et al., 2021; Li et al., 2022). This study proposed and confirmed a new model that uses flow theory's multidimensional construct, with dual hedonic and utilitarian values, to explain offline visit intentions in the museum context. Findings show that flow experience enhances both hedonic and utilitarian values, which in turn drive satisfaction and visit intention. This confirms VR's effectiveness as a marketing tool, consistent with previous research in various contexts such as destinations and hotels (Israel, Zerres & Tscheulin, 2019; An et al., 2021; Yung et al., 2021; Lee & Kim, 2021).

Beyond its instrumental role as a marketing and information-delivery tool, VR assumes a more profound role as a cultural mediator. In this capacity, technology does not merely present the cultural artefact; it actively recontextualises and reinterprets it for the audience. By allowing users to virtually inhabit the Dolmabahçe Palace, VR transcends the physical constraints of the real museum (e.g., rope barriers, crowds) and creates a highly personal, intimate encounter with history. This mediation role democratises access and forges affective connections by making heritage feel tangible and immediate. This reflection suggests that museums should view VR not just as a promotional gadget, but as a powerful medium for co-creating and transmitting cultural significance.

Furthermore, our differential analysis provides a fine-grained explanation for how flow drives value. We found that telepresence is the dominant driver of Hedonic Value, supporting Tussyadiah et al. (2018). Conversely, Focused Attention dominates Utilitarian Value, consistent with Lee and Wu (2017). This component-level analysis explains prior conflicting results by establishing how distinct flow dimensions target different value pathways. Interestingly, temporal distortion did not significantly affect hedonic value, likely because the content was non-interactive (Lake, 2016). However, its positive impact on utilitarian value suggests that the perception of efficiently acquired information remains a key component of functional benefit. The consistent result that high satisfaction ultimately leads to visit intention confirms that successful VR experiences translate into real-world behaviour (Lee et al., 2020).

5.1 *Theoretical Implications*

The primary conceptual advance of this study is the granular insight it offers into the inconsistent findings surrounding the flow–value relationship in VR research. While previous literature provided conflicting evidence, some indicating flow affects only hedonic value (Senecal et al., 2002) and others suggesting effects on both (Lee & Wu, 2017), our multidimensional approach resolves this theoretical ambiguity.

Our analysis confirms the prevailing view that museums are inherently hybrid services (Hyun et al., 2018). The finding that hedonic value has a greater impact on satisfaction (β = 0.630) than utilitarian value (β = 0.362) carries significant epistemological weight for cultural tourism. This suggests that the value of cultural heritage cannot be viewed as a purely utilitarian pursuit; instead, it is co-created through emotional engagement alongside intellectual fulfilment.

By identifying the differential effects of telepresence, focused attention, and temporal distortion, the study clarifies how distinct flow dimensions activate separate value pathways. This contributes to advancing flow theory in immersive technology contexts and extends its explanatory power in cultural tourism and VR marketing research.

5.2 *Practical Implications*

This study provides several strategic and actionable practical implications for museums aiming to leverage VR as an effective pre-visit marketing tool. First, the positive overall effect on offline visit intention confirms the utility of preparing and disseminating high-quality VR videos, particularly by presenting them to visitors at other high-traffic attractions to broaden reach.

More importantly, the multidimensional flow model yields transformative implications for the design of virtual experiences. The findings demonstrate that the psychological mechanism is contingent on the specific flow dimension engaged. Consequently, a one-size-fits-all VR experience is sub-optimal. Museums should adopt a strategic design approach that targets specific flow dimensions to achieve desired value outcomes.

The finding that telepresence is the dominant driver of Hedonic Value implies that developers should prioritise aesthetic realism, high visual fidelity, and spatial immersion. Conversely, the finding that Focused Attention dominates Utilitarian Value implies that designers should embed detailed content, high-quality audio narration, and clear information layers to effectively support cognitive engagement. By addressing both aesthetic pleasure and informational clarity, VR videos foster greater hedonic and utilitarian value, thereby significantly improving satisfaction and offline visit intention.

6. Conclusions

This study aimed to explain offline visit intention in the museum context by integrating flow theory's multidimensional structure with dual-path hedonic and utilitarian values. The findings confirm that flow experience enhances both value dimensions, thereby increasing satisfaction and visit intention. The results further demonstrate that telepresence primarily drives hedonic value, while focused attention primarily drives utilitarian value.

Overall, the study shows that VR functions not only as a marketing tool but also as a cultural mediator that recontextualises heritage and strengthens affective engagement. The integration of flow dimensions and value pathways provides a clearer understanding of how immersive VR experiences translate into real-world museum visits.

Despite these contributions, several limitations should be acknowledged. The study was conducted in a single, highly visited historical palace museum, which may limit generalizability to smaller or differently themed museums. In addition, the reliance on a non-interactive 360-degree VR video format may have influenced the observed relationships, particularly regarding temporal distortion and hedonic value. Future research should test the model across different museum types and compare non-interactive and fully interactive VR formats to further validate and extend the findings.

Credit author statement

All authors have contributed equally. All authors have read and agreed to the published version of the manuscript.

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References

Akdim, K., Casaló, L. V., & Flavián, C. (2022). The role of utilitarian and hedonic aspects in the continuance intention to use social mobile apps. *Journal of Retailing and Consumer Services*, 66, 102888. https://doi.org/10.1016/j.jretconser.2021.102888

An, S., Choi, Y., & Lee, C. (2021). Virtual travel experience and destination marketing: Effects of sense and information quality on flow and visit intention. *Journal of Destination Marketing & Management*, 19, 100492. https://doi.org/10.1016/j.jdmm.2020.100492

Babin, B. J., Darden, W. R., & Griffin, M. (1994). Work and/or fun: measuring hedonic and utilitarian shopping value. *Journal of Consumer Research*, *20*(4), 644-656. https://doi.org/10.1086/209376

Barta, S., Gurrea, R., & Flavián, C. (2023). The double side of flow in regret and product returns: Maximisers versus satisficers. *International Journal of Information Management*, 71, 102648. https://doi.org/10.1016/j.ijinfomgt.2023.102648

Byrne, B. M. (2016). *Structural equation modeling with AMOS* (3rd ed.). Routledge.

Cecilia, R. R. (2021). COVID-19 pandemic: Threat or opportunity for blind and partially sighted museum visitors? *Journal of Conservation and Museum Studies, 19*(1). https://doi.org/10.5334/jcms.200

Chin, W. W. (1998). Issues and opinions on structural equation modelling. *MIS Quarterly*, 22(1), 7-16.

Choi, J., Ok, C., & Choi, S. (2016). Outcomes of destination marketing organisation website navigation: The role of telepresence. *Journal of Travel & Tourism Marketing*, 33(1), 46-62. https://doi.org/10.1080/10548408.2015.1024913

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety: Experiencing flow in work and play*. Jossey-Bass.

Deng, X., Unnava, H. R., & Lee, H. (2019). Too true to be good? when virtual reality decreases interest in actual reality. Journal of Business Research, 100, 561-570. https://doi.org/10.1016/j.jbusres.2018.11.008

Deng, Y., Zhang, X., Zhang, B., Zhang, B., & Qin, J. (2023). From digital museuming to on-site visiting: the mediation of cultural identity and perceived value. *Frontiers in Psychology*, 14. https://doi.org/10.3389/fpsyg.2023.1111917

Fang, W., Zheng, L., Deng, H., & Zhang, H. (2017). Real-time motion tracking for mobile augmented/virtual reality using adaptive visual-inertial fusion. *Sensors*, *17*(5), 1037. https://doi.org/10.3390/s17051037

Fischer, E. and Arnold, S. (1990). More than a labor of love: gender roles and christmas gift shopping. *Journal of Consumer Research*, 17(3), 333. https://doi.org/10.1086/208561

Fornell, C. and Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: algebra and statistics. *Journal of Marketing Research*, 18(3), 382-388. https://doi.org/10.1177/002224378101800313

Gao, L. and Bai, X. (2014). Online consumer behaviour and its relationship to website atmospheric induced flow: insights into online travel agencies in China. *Journal of Retailing and Consumer Services*, 21(4), 653-665. https://doi.org/10.1016/j.jretconser.2014.01.001

Genç, V., Bilgihan, A., Genc, S. G., & Okumuş, F. (2023). Seeing history come to life with augmented reality: the museum experience of generation z in göbeklitepe. *Journal of Tourism and Cultural Change*, 21(6), 657-676. https://doi.org/10.1080/14766825.2023.2213679

Guttentag, D. (2010). Virtual reality: applications and implications for tourism. *Tourism Management*, 31(5), 637-651. https://doi.org/10.1016/j.tourman.2009.07.003

Hair, J. F., Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2008). *Multivariate data analysis* (7th ed.). Pearson Prentice Hall.

Han, S., An, M., Han, J. J., & Lee, J. (2020). Telepresence, time distortion, and consumer traits of virtual reality shopping. *Journal of Business Research*, 118, 311-320. https://doi.org/10.1016/j.jbusres.2020.06.056

Hanzaee, K. H., & Rezaeyeh, S. P. (2013). Investigation of the effects of hedonic value and utilitarian value on customer satisfaction and behavioural intentions. *African Journal of Business Management*, 7(11), 818. https://doi.org/10.5897/AJBM.9000369

Henseler, J., Ringle, C. M., & Sarstedt, M. (2014). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135. https://doi.org/10.1007/s11747-014-0403-8

Hoffman, D. L., & Novak, T. P. (2009). Flow online: lessons learned and future prospects. *Journal of Interactive Marketing*, *23*(1), 23-34. https://doi.org/10.1016/j.intmar.2008.10.003

Hyun, H., Park, J., Ren, T., & Kim, H. (2018). The role of ambiances and aesthetics on millennials' museum visiting behavior. *Arts and the Market*, 8(2), 152-167. https://doi.org/10.1108/aam-04-2017-0006

Immersionvr, (2024, Mart). VR for Tourism, https://immersionvr.co.uk/about-360vr/vr-for-tourism, Access Date: 28.03.2024. Immersion VR. (2024, March). VR for tourism. Retrieved March 28, 2024, from https://immersionvr.co.uk/about-360vr/vr-for-tourism/

Israel, K., Zerres, C., & Tscheulin, D. K. (2019). Presenting hotels in virtual reality: does it influence the booking intention?. *Journal of Hospitality and Tourism Technology*, 10(3), 443-463. https://doi.org/10.1108/jhtt-03-2018-0020

Kang, H. (2020). Impact of vr on impulsive desire for a destination. *Journal of Hospitality and Tourism Management*, 42, 244-255. https://doi.org/10.1016/j.jhtm.2020.02.003

Kerrebroeck, H. V., Brengman, M., & Willems, K. (2017). When brands come to life: experimental research on the vividness effect of virtual reality in transformational marketing communications. *Virtual Reality*, 21(4), 177-191. https://doi.org/10.1007/s10055-017-0306-3

Kim, M. and Thapa, B. (2018). Perceived value and flow experience: application in a nature-based tourism context. *Journal of Destination Marketing & Management*, 8, 373-384. https://doi.org/10.1016/j.jdmm.2017.08.002

Kim, M. J. and Hall, C. M. (2019). A hedonic motivation model in virtual reality tourism: comparing visitors and non-visitors. *International Journal of Information Management*, 46, 236-249. https://doi.org/10.1016/j.ijinfomgt.2018.11.016

Kim, M. J., Lee, C., & Jung, T. (2018). Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. *Journal of Travel Research*, 59(1), 69-89. https://doi.org/10.1177/0047287518818915

Komarac, T. and Došen, Đ. O. (2022). Discovering the determinants of museum visitors' immersion into experience: the impact of interactivity, expectations, and skepticism. *Current Issues in Tourism*, 25(22), 3675-3693. https://doi.org/10.1080/13683500.2021.1952941

Koufaris, M. (2002). Applying the technology acceptance model and flow theory to online consumer behavior. *Information Systems Research*, 13(2), 205-223. https://doi.org/10.1287/isre.13.2.205.83

Lake, J. I. (2016). Recent advances in understanding emotion-driven temporal distortions. *Current Opinion in Behavioral Sciences*, 8, 214-219. https://doi.org/10.1016/j.cobeha.2016.02.009

Lee, C. H., & Wu, J. J. (2017). Consumer online flow experience: The relationship between utilitarian and hedonic value, satisfaction and unplanned purchase. *Industrial Management & Data Systems*, *117*(10), 2452-2467. https://doi.org/10.1108/IMDS-11-2016-0500

Lee, S. J., Jeong, E., & Qu, K. (2019). Exploring theme park visitors' experience on satisfaction and revisit intention: a utilisation of experience economy model. *Journal of Quality Assurance in Hospitality & Tourism*, 21(4), 474-497. https://doi.org/10.1080/1528008x.2019.1691702

Lee, W.-j., & Kim, Y. H. (2021). Does VR Tourism Enhance Users' Experience? *Sustainability*, 13(2), 806. https://doi.org/10.3390/su13020806

Li, J., Nie, J.-W., Ye, J., & Mittal, P. (2022). Evaluation of virtual tour in an online museum: Exhibition of Architecture of the Forbidden City. *PloS One*, *17*(1), e0261607–e0261607. https://doi.org/10.1371/journal.pone.0261607

Li, J., Wider, W., Ochiai, Y., & Fauzi, M. A. (2023). A bibliometric analysis of immersive technology in museum exhibitions: exploring user experience. *Frontiers in Virtual Reality*, 4. https://doi.org/10.3389/frvir.2023.1240562

Li, T., & Chen, Y. (2019). Will virtual reality be a double-edged sword? Exploring the moderation effects of the expected enjoyment of a destination on travel intention. *Journal of Destination Marketing & Management*, 12, 15–26. https://doi.org/10.1016/j.jdmm.2019.02.003.

Liberatore, M. J. and Wagner, W. P. (2021). Virtual, mixed, and augmented reality: a systematic review for immersive systems research. *Virtual Reality,* 25(3), 773-799. https://doi.org/10.1007/s10055-020-00492-0

Ministry of Culture and Tourism. (2023). Dolmabahçe Palace Museum. Retrieved December 3, 2023, from https://www.ktb.gov.tr/EN-113763/dolmabahce-palace.html

Nam, K., Baker, J., & Dutt, C. S. (2024). Does familiarity with the attraction matter? Antecedents of satisfaction with virtual reality for heritage tourism. *Information Technology & Tourism*, *26*(1), 25-57. https://doi.org/10.1007/s40558-023-00273-w

Nugraha, S. Y. I., & Susanto, E. (2025). Structural Examination of Hedonic and Functional Satisfaction in Hotels: The Role of Aesthetics, Uniqueness, Haptics, and Social Media Reputation. *Journal of Tourism and Services*, 16(31), 46-64. https://doi.org/10.29036/7ewxzx41

Ozkan, E., Yasin, B., Gursen, A. E., & Akpinar, H. M. (2024). The effect of flow experience on reuse intention of mobile navigation apps: The mediating role of location-based mobile service quality. *Tourism & Management Studies*, 20(1), 1-19. https://doi.org/10.18089/tms.20240101

Özkara, B. Y., Özmen, M., & Kim, J. W. (2017). Examining the effect of flow experience on online purchase: a novel approach to the flow theory based on hedonic and utilitarian value. *Journal of Retailing and Consumer Services*, 37, 119-131. https://doi.org/10.1016/j.jretconser.2017.04.001

Prebensen, N. K., & Rosengren, S. (2017). Experience value as a function of hedonic and utilitarian dominant services. *International Journal of Contemporary Hospitality Management*, *28*(1), 113-135. https://doi.org/10.1108/IJCHM-02-2014-0073

Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. Computers & Education, 147, 103778. https://doi.org/10.1016/j.compedu.2019.103778

Rodríguez-Ardura, I., Artola, A. M., & Qian, F. (2024). The utilitarian and hedonic value of immersive experiences on wechat: examining a dual mediation path leading to users' stickiness and the role of social norms. *Online Information Review*, 48(2), 229-256. https://doi.org/10.1108/oir-04-2022-0208

Rodríguez, M. R. G., Díaz-Fernández, M. C., & Pino-Mejías, M. Á. (2020). The impact of virtual reality technology on tourists' experience: a textual data analysis. *Soft Computing*, 24(18), 13879-13892. https://doi.org/10.1007/s00500-020-04883-y

Ryu, K., Han, H., & Jang, S. (2010). Relationships among hedonic and utilitarian values, satisfaction and behavioral intentions in the fast-casual restaurant industry. *International Journal of Contemporary Hospitality Management*, *22*(3), 416-432. https://doi.org/10.1108/09596111011035981

Senecal, S., Gharbi, J. E., & Nantel, J. (2002). The influence of flow on hedonic and utilitarian shopping values. *Advances in Consumer Research*, *29*(1), 483–484.

Serravalle, F., Ferraris, A., Vrontis, D., Thrassou, A., & Christofi, M. (2019). Augmented reality in the tourism industry: A multi-stakeholder analysis of museums. *Tourism Management Perspectives*, *32*, 100549. https://doi.org/10.1016/j.tmp.2019.07.002

Soares, A. M., Casais, B., Calvo-Porral, C., & Oliveira, A. (2025). The'Insta'effect on the intention to visit a destination: a case for conspicuous consumption?. Tourism & Management Studies, 21(2), 1-11. https://doi.org/10.18089/tms.20250201

Tabachnick, B. G. & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.), Boston: Pearson, Allyn & Bacon.

Talwar, S., Kaur, P., Nunkoo, R., & Dhir, A. (2022). Digitalisation and sustainability: virtual reality tourism in a post pandemic world. *Journal of Sustainable Tourism*, 31(11), 2564-2591. https://doi.org/10.1080/09669582.2022.2029870

Tengilimoglu, E., & Hassan, A. (2020). Applying Flow Theory to the Online Booking Experience: The Role of Utilitarian and Hedonic Features. *Journal of Tourismology*, 6(1), 1-12. https://doi.org/10.26650/jot.2020.6.1.0010

tom Dieck, M. C., Jung, T. H., & Rauschnabel, P. A. (2018). Determining visitor engagement through augmented reality at science festivals: An experience economy perspective. *Computers in Human Behavior*, *82*, 44-53. https://doi.org/10.1016/j.chb.2017.12.043

Tourism Australia. (2024, March). New research confirms the potential of virtual reality for destination marketing. Retrieved March 27, 2024, from http://www.tourism.australia.com/content/dam/assets/document/1/6/y/7/t/2003897.pdf

Tussyadiah, I. P., Wang, D., Jung, T. H., & Tom Dieck, M. C. (2018). Virtual reality, presence, and attitude change: Empirical evidence from tourism. *Tourism Management*, *66*, 140-154. https://doi.org/10.1016/j.tourman.2017.12.003

Vieira, V. A., Rafael, D. N., & Agnihotri, R. (2022). Augmented reality generalisations: A meta-analytical review on consumer-related outcomes and the mediating role of hedonic and utilitarian values. *Journal of Business Research*, 151, 170-184. https://doi.org/10.1016/j.jbusres.2022.06.030

Violante, M. G., Vezzetti, E., & Piazzolla, P. (2019). How to design a virtual reality experience that impacts the consumer engagement: the case of the virtual supermarket. *International Journal on Interactive Design and Manufacturing (IJIDeM)*, 13(1), 243-262. https://doi.org/10.1007/s12008-018-00528-5

Wang, J., Sun, Y., Zhang, L., Zhang, S., Ling, F., & Morrison, A. M. (2023). Effect of display methods on intentions to use virtual reality in museum tourism. *Journal of Travel Research*, 63(2), 314-334. https://doi.org/10.1177/00472875231164987

Wang, Y., Stash, N., Sambeek, R. v., Schuurmans, Y., Aroyo, L., Schreiber, G., … & Gorgels, P. (2009). Cultivating personalised museum tours online and on-site. *Interdisciplinary Science Reviews*, 34(2-3), 139-153. https://doi.org/10.1179/174327909x441072

Weaver, D. B., & Lawton, L. J. (2011). Visitor loyalty at a private South Carolina protected area. *Journal of Travel Research*, *50*(3), 335-346. https://doi.org/10.1177/0047287510362920

Wei, W. (2019). Research progress on virtual reality (vr) and augmented reality (ar) in tourism and hospitality. *Journal of Hospitality and Tourism Technology*, 10(4), 539-570. https://doi.org/10.1108/jhtt-04-2018-0030

Wei, W., Qi, R., & Zhang, L. (2019). Effects of virtual reality on theme park visitors' experience and behaviors: A presence perspective. *Tourism Management*, 71, 282–293. https://doi.org/10.1016/j.tourman.2018.10.024.

Yang, X. and Zhang, L. (2022). Smart tourism technologies towards memorable experiences for museum visitors. *Tourism Review*, 77(4), 1009-1023. https://doi.org/10.1108/tr-02-2022-0060

Yung, R. & Khoo-Lattimore, C. (2017). New realities: a systematic literature review on virtual reality and augmented reality in tourism research. *Current Issues in Tourism*, 22(17), 2056-2081. https://doi.org/10.1080/13683500.2017.1417359

Yung, R., Khoo-Lattimore, C., & Potter, L. E. (2021). Vr the world: experimenting with emotion and presence for tourism marketing. *Journal of Hospitality and Tourism Management*, 46, 160-171. https://doi.org/10.1016/j.jhtm.2020.11.009

Zhang, R., & Abd Rahman, A. (2022). Dive in the flow experience: millennials' tech-savvy, satisfaction and loyalty in the smart museum. *Current Issues in Tourism*, *25*(22), 3694-3708.. https://doi.org/10.1080/13683500.2022.2070459

Zouair, N., Abou-Shouk, M., Idriz, M., & Okleh, I. (2025). The Impact of Smart Technologies on Innovative Tourist Memorable Experience and Revisit Intention: The Mediation of Technology-Task Fit. *Journal of Tourism and Services*, 16(31), 27-45. https://doi.org/10.29036/tkk4ah55