information

Article

Behavioral Intentions in Metaverse Tourism: An Extended Technology Acceptance Model with Flow Theory

Qi Wu [1], Ming-Qi Li [1] and Jun-Hui Wang [2,*]

[1] Department of Leisure Service and Sport, Paichai University, Daejeon 35345, Republic of Korea; 2347706@pcu.ac.kr (Q.W.); 2347602@pcu.ac.kr (M.-Q.L.)
[2] College of Tourism, Hunan Normal University, 36 Lushan Road, Yuelu District, Changsha 410081, China
* Correspondence: junhuiw@hunnu.edu.cn; Tel.:+86-18237568337

Abstract: This study aims to develop a new theoretical framework from the perspective of the Technology Acceptance Model (TAM), incorporating flow theory, to explore the factors influencing behavioral intentions to participate in metaverse tourism. Using data from 518 respondents with metaverse experience and participation in metaverse tourism, the study employed R Studio and Structural Equation Modeling (SEM) to test the relationships between variables in the model. The results indicate that metaverse flow has a significant positive impact on users' perceived usefulness and perceived ease of use, with flow demonstrating strong explanatory power as a precursor factor. Perceived usefulness and perceived ease of use are predictors of users' attitudes to using metaverse technology. A positive attitude towards the metaverse can enhance users' support for metaverse tourism and their behavioral intention to participate in it, while support also positively influences behavioral intention. Support for metaverse tourism acts as a clear mediator between attitudes and behavioral intention. The newly developed theoretical framework in this study provides a fresh perspective for metaverse tourism research and helps enrich empirical analysis in this field. By deeply analyzing tourists' behavioral intentions, the study provides valuable insights for stakeholders to develop targeted marketing strategies and services, thus promoting the future development of metaverse tourism.

Keywords: metaverse; metaverse tourism; technology acceptance model (TAM); flow theory; support

check for updates

Citation: Wu, Q.; Li, M.-Q.; Wang, J.-H. Behavioral Intentions in Metaverse Tourism: An Extended Technology Acceptance Model with Flow Theory. *Information* **2024**, *15*, 632. https://doi.org/10.3390/info15100632

Academic Editors: Andrea Sanna and Lucio Tommaso De Paolis

Received: 19 September 2024
Revised: 10 October 2024
Accepted: 10 October 2024
Published: 13 October 2024

Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

The metaverse has moved from its early concepts and technological exploration to a stage of widespread understanding and important technological advances. This development has attracted global attention. Although the gaming industry has been the primary driver of the metaverse's explosive growth, its potential extends far beyond this sector. According to Dwivedi et al. [1], the metaverse is poised to impact a wide range of industries, including marketing, education, tourism, and healthcare. The growing popularity of the metaverse can be attributed to the increased convenience it brings to our daily lives and its substantial influence on changing lifestyles. This effect has been particularly magnified in the context of the global pandemic. The metaverse is powered by immersive technologies, such as mixed reality (MR), augmented reality (AR), and virtual reality (VR), alongside advanced network infrastructure and enabling platforms [2]. These technologies are designed to provide users with deeply immersive experiences.

The surge in metaverse development, fueled by the global pandemic, has prompted the tourism industry to explore new avenues for growth. According to Koohang et al. [3], the advent of metaverse tourism is considered one of the most innovative and promising developments in the digital transformation of the tourism and hospitality sectors. The integration of digital technologies increasingly blurs the boundaries between the physical and virtual worlds. The metaverse, by offering immersive, environmentally friendly and

pandemic-compliant hotel and tourism experiences, holds significant potential to disrupt the entire industry and reshape the way people explore and experience the world [4]. Organizations like UNESCO are working with technology companies to use virtual reality and metaverse platforms to rebuild and promote cultural heritage sites around the world. These virtual reconstructions not only help preserve cultural heritage but also provide visitors with an unprecedented immersive experience of these historic landmarks. China's Zhangjiajie has also integrated the metaverse with tourism through the "Zhangjiajie Planet" platform. Similarly, a research team at Kyoto University in Japan has developed "Terraverse" (temple metaverse tourism) for online tourism activities, such as temple visits, incense offerings, and prayers. Incheoncraft provides virtual travel experiences in South Korea through the Incheon Edition of Minecraft. The metaverse offers users endless opportunities to explore new tourist destinations, experience different cultures, and engage in tourism activities that may be impossible or inaccessible in the real world [5]. In addition, it has the potential to encourage visitors to physically visit destinations after participating in metaverse tourism activities or to continue engaging in metaverse tourism even after a physical visit [6].

As a hot topic in recent years, the metaverse and metaverse tourism have attracted widespread attention from academia. Jafar et al. [7] explored the impact of immersive tourism experiences and cognitive perceptions on metaverse tourist loyalty. Zhang et al. [8], guided by self-determination theory and the theory of planned behavior, examined the determinants of Gen Z and Gen Y participation in metaverse tourism. Mandal et al. [9] used the Technology Acceptance Model to explore the key drivers influencing Gen Z participation in and satisfaction with metaverse tourism and its effect on their word-of-mouth intentions

Previous research on the tourism sector has been relatively limited [10], and the logic of metaverse application in the tourism industry remains unclear [2]. Flow has often been treated as an outcome variable. However, given the characteristics of the metaverse and metaverse tourism, this study positions flow as a precursor variable to explore the relationship between metaverse flow and users' acceptance and attitudes towards this technology. Moreover, the mechanism by which users' attitudes influence their behavioral intentions to participate in metaverse tourism is still not well understood. To better understand the relationship between these factors, this study draws on social exchange theory and incorporates metaverse tourism support as a mediating variable in the research model. Therefore, combining flow theory with the perspective of the Technology Acceptance Model (TAM), this study aims to develop an innovative research model to investigate the factors influencing behavioral intentions in metaverse tourism. This research aligns with current trends and scholarly calls in the field and will also enrich quantitative research in the metaverse tourism field and provide insights into the future development of this field. These insights will help the tourism and hospitality industries create targeted marketing strategies and design immersive experiences that lead to more satisfying tourist experiences. As a complement to traditional tourism, the development of metaverse tourism can help diversify and promote the growth of the tourism industry.

2. Theoretical Background and Hypotheses

2.1. Metaverse and Metaverse Tourism

The term metaverse was first introduced in 1992 by Neal Stephenson in his science fiction novel Snow Crash, where "meta" means beyond, and "verse" means universe. In his view, the metaverse is a virtual space distinct from the real world.

With the development of technology, the metaverse integrates multiple virtual technologies such as digital twins and blockchain. It provides immersive virtual interactions, mirrored realities, and a systematic economy. It represents a new form of Internet application and social structure. The countless scenarios it builds transcend the boundaries between reality and virtuality, showcasing strong collective interactivity, technological empowerment, artificial intelligence, and digitalization. In other words, the metaverse vir-

tualizes real society through advanced technology, significantly impacting human economic and social life and breaking existing rules, systems, and barriers.

The academic community has not yet developed a unified definition of the metaverse. Some scholars believe the metaverse is a digital world that exists beyond reality and propose that the metaverse includes four dimensions, augmented reality (AR), lifelogging, mirror world, and virtual reality (VR) [11], with VR being a critical component supporting its development [12]. In 2021, Facebook(Menlo Park, CA, USA) officially renamed itself "Meta", proposing to build a metaverse company within five years. According to CEO Mark Zuckerberg, the metaverse is the future of the Internet, where breakthroughs in digital technology can create hyper-realistic virtual spaces, renewing and expanding the scope of human social activities. The metaverse has the potential to enhance everyday life, creating a fully immersive shared space to meet everyday needs such as entertainment, work, and social interaction [13].

The metaverse's development is in full swing. A report by McKinsey & Company (Chicago, IL, USA) (2022) indicates that since 2022, more than USD 1.2 trillion has been invested in the metaverse, with 79% of active users spending money on metaverse platforms. The current value of virtual space within the metaverse is USD 6.3 billion and is expected to grow to USD 84.09 billion by the end of 2028 [14].

The metaverse has impacted various industries. It has been applied in the hospitality and tourism sectors, where activities such as attending meetings, concerts, visiting museums, and touring tourist attractions can all be delivered within metaverse systems. Unlike the real-world tourism experience, which requires preparation, travel, time, money, and effort, virtual reality tourism can replace physical tourism, providing tourists with a relatively complete tourism experience and offering advanced entertainment experiences to visitors [15,16]. Although current virtual reality tourism cannot provide the same social and sensory satisfaction as physical travel, as metaverse technology develops, it can create unique multi-sensory immersive experiences, offering more realistic hospitality and tourism experiences to attract customers [4,6]. Especially in the post-pandemic era, the development trend in tourism is highly innovative and technology-oriented [17]. Digitalization is transforming traditional tourism methods, with virtual reality technology providing an innovative foundation for the development of the tourism industry [18–20]. With the rise of the metaverse, metaverse tourism has emerged. Koo et al. [21] propose that metaverse tourism can be understood as "a new form of tourism that integrates objects, humans, avatars, interfaces, and networking capabilities". Lee et al. [5] believe that metaverse tourism breaks the limitations of time and space, attracting tourists with a novel, convenient, and highly immersive interactive way of traveling.

In summary, this study defines metaverse tourism as the use of VR, AR, and other immersive technologies to achieve virtual visits to real-world tourism destinations in digital space, emphasizing the tourist experience throughout the process.

2.2. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) [22] is an important framework for understanding how users accept and use new technology. It is based on Ajzen and Fishbein's theory of reasoned action (TRA). The TAM predicts users' intentions and behaviors regarding technology use through two core variables: perceived usefulness (the degree to which a person believes that using a particular system will enhance their job performance) and perceived ease of use (the degree to which a person believes that using a particular system will be effortless). According to Granić and Marangunić [23], the TAM is widely recognized as one of the most well-known models for predicting technology adoption and usage behavior. Scholars are increasingly using the TAM across different domains to predict user acceptance of learning technologies, such as education [24], healthcare [25], and e-commerce [26]. However, due to the TAM's limited consideration of external variables, it often requires integration with other theories for expansion. The Extended Technology

Acceptance Model (ETAM) incorporates external variables into the TAM, making the model more comprehensive and capable of explaining more behavioral variation.

As an emerging technology, the metaverse has attracted significant scholarly attention. Oh [27] used the ETAM to study factors influencing the intention to use the metaverse. Wu and Yu [28] used the ETAM to investigate user acceptance of the metaverse. However, there is a notable lack of research combining the ETAM with metaverse tourism activities. Liu and Park [29] integrated the TAM with the TPB to explore the impact of metaverse tourism experiences on actual visit intentions. Given the ETAM's excellent predictive capabilities, this study combines flow theory with the TAM as the appropriate framework.

2.3. Flow Theory

The concept of flow theory was first introduced by psychologist Csikszentmihalyi in 1975 to describe the optimal experiential state individuals reach when fully engaged in a particular activity. Csikszentmihalyi et al. [30] described flow as "a state of complete immersion in an activity that is challenging, leading to a pleasurable state where the self disappears". Key characteristics of the flow state include clear goals and feedback mechanisms, high concentration without distractions, balance between challenge and skill, a distorted sense of time, a lack of concern about failure and satisfaction with the activity, and the loss of self-awareness.

Flow theory has been widely applied in education to stimulate students' interest and enhance their motivation to learn [31,32]. In addition to education, flow theory has also shown significant effectiveness in explaining online purchasing behavior [33], completing daily tasks [34], and workplace well-being [35]. In the field of tourism, Wu and Liang [36] used flow theory to study tourists' motivations for participating in rafting activities. Zhang et al. [37] explored the relationship between the experience economy model and the multidimensions of flow theory in performance tourism. Hoffman and Novak [38] indicated that flow theory is suitable for studying the behavioral intentions and perceptions of VR users, which has led to its increasing application in virtual tourism [39,40]. Moreover, some scholars have used flow theory to study metaverse technologies and virtual spaces [41,42]. However, there is a notable lack of research combining metaverse tourism activities with flow theory. Since metaverse tourism aims to provide immersive travel experiences, integrating it with flow theory is highly appropriate. Therefore, this study combines metaverse tourism with flow theory to explore strategies for optimizing immersive experiences, providing new insights for the development of the tourism industry and related technologies.

2.4. Hypothetical Relationships

2.4.1. Relationships between Flow and Perceived Usefulness and Perceived Ease of Use

Flow is always associated with positive affective valence, whereas immersion does not inherently presuppose positive emotions [43]. Flow differs from general user engagement. Flow is usually associated with extremely high levels of satisfaction and creativity. In contrast, engagement focuses more on the interaction process between users and products or services, including the frequency, duration, and depth of interaction. Users with high engagement may use a product frequently and for extended periods, but they may not necessarily experience flow. Flow plays a significant role in augmented reality technologies [20], enhancing user engagement and enjoyment in online entertainment [44]. It can also influence and alter users' behavior in learning computer skills and participating in online leisure activities [45].

Previous studies have shown that in social interaction-focused games or virtual environments, the simplicity and convenience of the interface can enhance the flow state of users [46]. In addition, Han et al. [47] found a positive correlation between factors that enhance user flow status and antecedents of technology acceptance. Both flow theory and the TAM have shown strong explanatory power in predicting user behavioral intentions. Kim and Hall [40] combined flow theory with TAM, verifying that perceived usefulness

positively affects the flow state of tourists. Yang et al. [48] used the SOR (stimulus–organism–response) framework, integrating the TAM and technology readiness (TR) model, to verify that the flow experience brought by virtual tourism can enhance tourists' perceptions of the usefulness and ease of the use of technology. The existing literature shows that only a few studies have combined flow theory with the TAM, and these studies primarily consider flow as a subsequent factor to perceived usefulness and the ease of use. Research examining flow as an antecedent is lacking. Ruangkanjanases et al. (2024) investigated the flow experience in online shopping behavior as a precursor to perceived usefulness in the e-commerce sector [49]. Given that incorporating the flow state to extend TAM can enhance its explanatory power [45] and address this research gap, the following hypotheses are proposed:

Hypothesis 1. *Metaverse technology flow has a significant positive impact on users' perceived usefulness.*

Hypothesis 2. *Metaverse technology flow has a significant positive impact on users' perceived ease of use.*

2.4.2. Relationships between Perceived Usefulness and Perceived Ease of Use and Attitude

This study develops a framework based on past research results to explain the factors influencing tourists' behavioral intentions to participate in metaverse tourism. Because technologies such as VR and AR involved in metaverse platforms are already familiar to the public and have been experienced in various social media and games, this familiarity can significantly help users reduce the associated technological barriers. In addition, the unique experiences and conveniences provided by metaverse technology allow users to tangibly perceive its benefits, which can further reduce their focus on perceived ease of use, thereby enhancing their perception of usefulness. According to Fishbein and Ajzen [50], attitude is the tendency to respond positively or negatively to a psychological object. The TAM has demonstrated that users' attitudes toward technology acceptance are influenced by perceived usefulness and perceived ease of use [51], and this has also been validated in the context of virtual tourism [48,52]. In the context of metaverse tourism, the TAM has not been widely applied and studied. Mandal et al. [9] verified that Generation Z tourists' perceived enjoyment and ease of use positively impacted their engagement and satisfaction. Liu and Park [29] found a significant positive correlation between perceived usefulness and attitude but no statistical correlation between perceived ease of use and attitude. Based on the above research, the following hypotheses are proposed:

Hypothesis 3. *Perceived usefulness has a significant positive impact on users' attitudes to using the metaverse.*

Hypothesis 4. *Perceived ease of use has a significant positive impact on users' attitudes to using the metaverse.*

2.4.3. Relationships between Attitude and Support

Gursoy et al. [53] indicated in their research that residents' support for the tourism industry is often understood as their attitude towards tourism. However, some studies interpret residents' support or opposition to tourism as their behavioral intention or behavior towards the industry [54]. In sustainable tourism, scholars have examined factors influencing residents' support for sustainable tourism development, including attitudes [55,56], community attachment [57], and perceived benefits [53]. Nunkoo and Gursoy [58] used social exchange theory and identity theory to verify the impact of residents' attitudes on their support for the tourism industry. Therefore, based on the above research, the following hypothesis is proposed:

Hypothesis 5. *Attitudes to using the metaverse have a significant positive impact on support for metaverse tourism.*

2.4.4. Relationships between Attitude and Behavioral Intention

The concept of behavioral intention originates from attitude theory in psychology. Hyun and O'Keefe [59] pointed out that behavioral intention is an individual's positive or negative behavioral tendency or intention towards an attitude object, generally referring to the likelihood or tendency of an individual to take a specific action or approach based on their attitude. In the field of tourism, researchers often interpret behavioral intention as the intention to revisit or repurchase and the willingness to recommend tourism products to others [60]. The relationship between attitude and behavioral intention has been well demonstrated in the TAM and other theoretical models (e.g., the TRA). Previous studies also support that a positive attitude toward metaverse technology enhances tourists' behavioral intentions to participate in metaverse tourism [29]. Based on the above research, the following hypothesis is proposed:

Hypothesis 6. *Attitudes to using the metaverse have a significant positive impact on the behavioral intention to participate in metaverse tourism.*

2.4.5. Relationships between Support and Behavioral Intention

Support can be defined as "a forward-looking action orientation that provides additional backing for a cause through behavioral actions" [61]. Social exchange theory plays a crucial role in explaining the relationship between residents' support for tourism and their perceived benefits from the tourism industry. In other words, residents are more likely to show positive behavioral intentions and actions towards tourism if they can benefit from its development [62,63]. Recent studies have also shown that gamification technologies are increasingly being used to motivate individuals to support various beneficial personal and collective behaviors, thus encouraging the use of such technologies [64]. Metaverse tourism enhances metaverse technology by adding elements of fun and enjoyment, which fosters users' support for technology and drives their intention to participate in metaverse tourism. Previous research has rarely explored support as a precursor to behavioral intentions, with more studies focusing on related variables such as satisfaction [65,66]. To address this research gap, the following hypotheses are proposed:

Hypothesis 7. *Support for metaverse tourism has a significant positive impact on the intention to participate in metaverse tourism.*

3. Methodology

3.1. Measurement

This study used multiple indicators to develop questionnaire items, enhancing validity by considering various aspects of constructions [67]. The questionnaire items were designed using a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5), and were divided into two sections. The first section included items related to the research variables, while the second section collected demographic information from respondents, including the following seven items: gender, age, place of residence, education level, marital status, occupation, and monthly income level. The study referenced several established scales from previous research. Based on prior studies, metaverse flow was measured with six items [40,68], the perceived usefulness of metaverse technology with four items [52,69], the perceived ease of use of metaverse technology with four items [52,69], attitude towards the metaverse with three items [58,70], support for metaverse tourism with four items [58,71], and behavioral intention to participate in metaverse tourism with five items [69,72]. To ensure the effectiveness of the content, the questionnaire items were reviewed by three scholars from the metaverse technology field and three from the tourism field. In addition, a pilot test was conducted with 30 users with experience in using the metaverse and participating in metaverse tourism. This helped clarify the items further and, to some extent, reduced the potential for respondents to exaggerate the positive aspects due to novel effects. The specific items of the questionnaire will be detailed later.

The specific model of this study is illustrated in Figure 1.

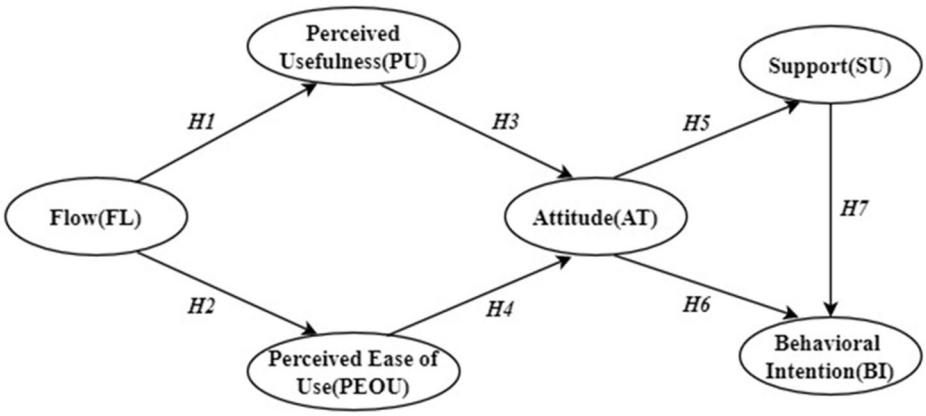


Figure 1. The proposed research model.

3.2. Data Collection and Analysis

The questionnaire used in this study aims to collect data from a representative sample in South Korea on user flow, perceived usefulness, perceived ease of use, and attitudes towards metaverse technology, as well as their support for and behavioral intentions towards metaverse tourism. South Korea, as a strong player in information technology, has shown great interest and support for the development of the metaverse and its applications in various fields. Therefore, the survey targeted respondents in South Korea aged 14 and older who have used the metaverse and have experience with metaverse tourism. Before answering the questions, each participant ensured a clear understanding of the research objectives and questions. Special consideration was given to selecting respondents under 18, as the metaverse user base tends to be relatively young. Their perspectives are crucial to understanding the attitudes and status of the younger generation using the metaverse and participating in metaverse tourism. The questionnaire explicitly stated that all responses would be anonymous and used solely for research purposes, thus protecting respondents' information security. Due to the flexibility and convenience of metaverse tourism in terms of devices, time and location, which differ from traditional tourism, the survey was conducted online rather than selecting specific case locations. The survey lasted four days, from 20 to 23 March 2023. Data were collected from respondents through quota sampling, considering demographic information such as age, gender, and residence. A total of 560 questionnaires were collected during this period. After eliminating invalid responses characterized by excessively short completion times and identical response patterns, 518 valid questionnaires were retained for detailed analysis. The effective response rate was 92.5%.

To test the relationships and effects presented in the research model, this study employed the Structural Equation Modeling (SEM) method and used R-Studio 4.3.2 to analyze the collected data. Gay and Airasian [73] noted that if the population size is around 5000 or more, the sample size for the SEM should exceed 400. The sample size in this study meets this requirement, ensuring the accuracy of the estimates.

4. Results

4.1. Descriptive Statistics of Respondents

The demographic characteristics of the respondents are shown in Table 1. The gender distribution of the respondents is balanced, with a roughly equal ratio of males to females. Most respondents were between 20 and 39 (72.4%), indicating that the younger population shows greater interest in the metaverse and metaverse tourism. Respondents generally have a high level of education. Regarding marital status, most respondents are married (61.6%). In terms of occupation, office workers make up the largest group, followed by students and professionals, accounting for 77.4% collectively. Geographically, respondents are widely distributed, with the largest populations in Seoul (37.8%) and Gyeonggi-do

(28.6%). In terms of monthly income, most respondents fall into the middle to lower income range.

Table 1. Demographic characteristics of respondents. (N = 518).

Characteristics	*N* (%)	Characteristics	*N* (%)
Gender		Career	
Male	256 (49.4)	Professional/Technical Position	65 (12.5)
Female	262 (50.6)	Entrepreneur (Including Self-Employed)	20 (3.9)
Age		Service Industry	17 (3.3)
14–19 years old	42 (8.1)	Office Worker	219 (42.3)
20–29 years old	171 (33.0)	Civil Service	20 (3.9)
30–39 years old	204 (39.4)	Military	2 (0.4)
40–49 years old	83 (16.0)	Students	117 (22.6)
50–59 years old	17 (3.3)	Housewife	21 (4.1)
60–69 years old	1 (0.2)	Freelance	20 (3.9)
Education		Others	17 (3.3)
High school	67 (12.9)	Residence	
College	42 (8.1)	Seoul	196 (37.8)
University	352 (68.0)	Busan	29 (5.6)
Postgraduate or above	57 (11.0)	Daegu	15 (2.9)
Marital status		Incheon	32 (6.2)
Married	319 (61.6)	Gwangju	10 (1.9)
Unmarried	198 (38.2)	Daejeon	12 (2.3)
Divorced	1 (0.2)	Ulsan	3 (0.6)
Monthly income		Gyeonggi-do	148 (28.6)
less than USD 800	108 (20.8)	Gangwon-do	7 (1.4)
USD 800~USD 1600	43 (8.3)	Chungcheongbuk-do	7 (1.4)
USD 1600~USD 2400	106 (20.5)	Chungcheongnam-do	13 (2.5)
USD 2400~USD 3200	87 (16.8)	Jeollabuk-do	10 (1.9)
USD 3200~USD 4000	59 (11.4)	Jeollanam-do	7 (1.4)
USD 4000~USD 4800	40 (7.7)	Gyeongsangbuk-do	12 (2.3)
USD 4800~USD 5600	20 (3.9)	Gyeongsangnam-do	10 (1.9)
USD 5600~USD 6400	23 (4.4)	Jeju Island	4 (0.8)
Over USD 6400	32 (6.2)	Sejong	3 (0.6)

Note: USD 1 ≈ KRW 1369.

4.2. Measurement Model

Before testing the causal relationships among the components, we estimated the measurement model of this study by performing confirmatory factor analysis (CFA). The proposed measurement model fits the data well, as shown in Table 2 (CFI = 0.954, NFI = 0.909, NNFI = 0.947, and RMSEA = 0.042). In addition, as shown in Table 3, all factor loadings are greater than 0.5. Moreover, in terms of reliability, each construct demonstrates sufficient reliability, as all Cronbach's Alpha values are greater than 0.7 [74].

Table 4 provides statistics on convergent and discriminant validity. All average variance extracted (AVE) values and composite reliability (CR) values for multiple scales exceed the minimum thresholds of 0.5 and 0.7, respectively [75], confirming convergent validity. In addition, the AVE for each construct is generally greater than the squared correlation coefficients, indicating that the discriminant validity is generally satisfactory.

Table 2. Results of goodness-of-fit indices for measurement model.

Measurement	χ^2	df	Normed χ^2	CFI	NFI	NNFI	RMSEA
Model	543.762	284	1.915	0.954	0.909	0.947	0.042
Suggested value *			≤3	≥0.9	≥0.9	≥0.9	≤0.08

Note: * suggested values were based on Hair et al. [75].

Table 3. Reliability and confirmatory factor analysis.

Factors and Scale Items	Standardized Loading	Cronbach's Alpha
F1: Flow (FL)		
I imagine making the metaverse amazing.	0.731	0.890
Metaverse is an important part of my daily life.	0.845	
I feel joy in the metaverse.	0.709	
I strive to obtain information related to the metaverse.	0.704	
The metaverse is my favorite hobby activity.	0.794	
I lose track of time when I am in the metaverse.	0.777	
F2: Perceived Usefulness (PU)		
The metaverse will be useful to me.	0.767	0.881
The metaverse will enhance my daily life.	0.814	
I can achieve the desired results through the metaverse.	0.821	
The metaverse provides me with valuable information.	0.825	
F3: Perceived Ease of Use (PEOU)		
The configuration of the metaverse is convenient to use.	0.735	0.823
The method of using the metaverse is generally easy and simple.	0.763	
Using the metaverse requires little effort.	0.701	
It is easy to obtain the desired information through the metaverse.	0.740	
F4: Attitude (AT)		
The metaverse is of high quality.	0.662	0.745
The metaverse is valuable.	0.752	
The metaverse is attractive.	0.710	
F5: Support (SU)		
I think there should be more promotion of metaverse tourism.	0.803	0.898
I support policies for metaverse tourism.	0.843	
The influence of metaverse tourism will gradually grow.	0.813	
Metaverse tourism needs to be promoted.	0.858	
F6: Behavioral Intention (BI)		
I will recommend metaverse tourism to people around me.	0.875	0.916
I will speak positively about metaverse tourism to people around me.	0.863	
I will share information about metaverse tourism with people around me.	0.821	
I will visit metaverse tourist destinations in the future.	0.763	
When planning real trips in the future, I will prioritize the tourist destinations I visited in the metaverse.	0.815	

Notes: all standardized factor loadings are significant at $p < 0.001$.

Table 4. Results of measurement model ($N = 518$).

Construct	FL	PU	PEOU	AT	SU	BI
FL	1.000					
PU	0.777 (0.603)	1.000				
PEOU	0.673 (0.452)	0.753 (0.567)	1.000			
AT	0.713 (0.509)	0.750 (0.562)	0.586 (0.343)	1.000		
SU	0.526 (0.277)	0.625 (0.390)	0.443 (0.197)	0.659 (0.435)	1.000	
BI	0.620 (0.385)	0.666 (0.444)	0.495 (0.245)	0.641 (0.411)	0.889 * (0.790)	1.000
CR	0.892	0.882	0.825	0.752	0.898	0.916
AVE	0.580	0.651	0.541	0.503	0.688	0.686

Notes: * pairs of constructs with highest correlations; numbers in parenthesis indicate squared correlations among latent constructs; correlation coefficients are estimated from R.

4.3. Structural Model

Figure 2 summarizes the estimated results of the research model proposed in this study. The results confirm that the proposed structural model fits the data well (χ^2 = 641.848, df = 292, χ^2/df = 2.198, RMSEA = 0.048, CFI = 0.938, NFI = 0.892, and NNFI = 0.931). The hypothesis testing results are shown in Table 5 and Figure 2. Users' flow in metaverse technology has a significant positive impact on perceived usefulness and perceived ease of use (βFL→PU = 0.820, *t* = 38.604; βFL→PEOU = 0.713, *t* = 21.035). H1 and H2 are supported. Users' perceived usefulness and perceived ease of use of metaverse technology have a significant positive impact on their attitude (βPU→AT = 0.770, *t* = 17.721; βPEOU→AT = 0.103, *t* = 2.020). Thus, H3 and H4 are supported. Furthermore, users' attitude towards using the metaverse significantly positively influences their support for metaverse tourism and their behavioral intention to participate in metaverse tourism (βAT→SU = 0.708, *t* = 15.338; βAT→BI = 0.192, *t* = 3.043). H5 and H6 are supported. Lastly, users' support for metaverse tourism has a significant positive impact on their behavioral intention to participate in metaverse tourism (βSU→BI = 0.753, *t* = 13.534). Thus, H7 is supported.

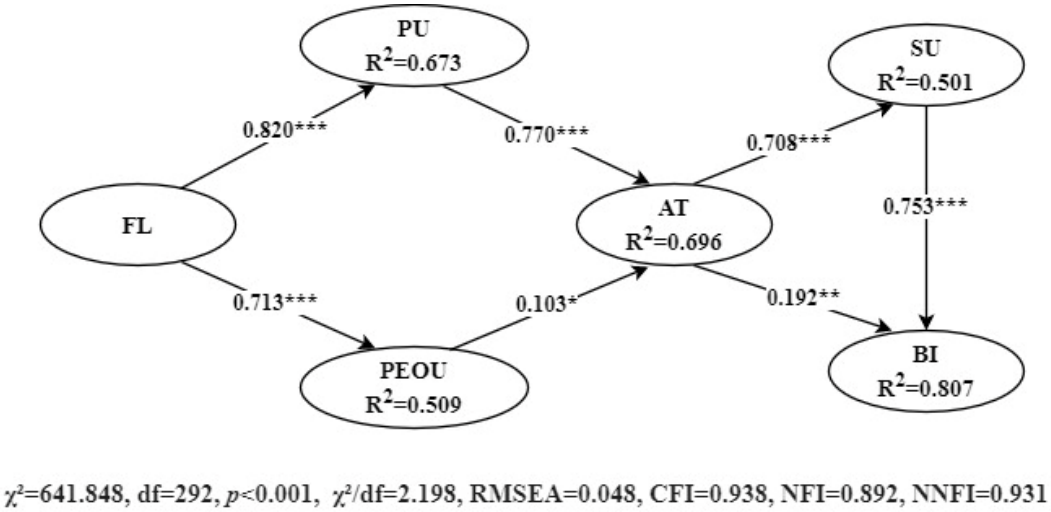


Figure 2. Results of the structural model. Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5. Standardized parameter estimates of structural model (*N* = 518).

Hypotheses		Coefficients	*t*-Values	Test of Hypotheses
H1	FL→PU	0.820 ***	38.604	Accepted
H2	FL→PEOU	0.713 ***	21.035	Accepted
H3	PU→AT	0.770 ***	17.721	Accepted
H4	PEOU→AT	0.103 *	2.020	Accepted
H5	AT→SU	0.708 ***	15.338	Accepted
H6	AT→BI	0.192 **	3.043	Accepted
H7	SU→BI	0.753 ***	13.534	Accepted

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. FL = flow; PU = perceived usefulness; PEOU = perceived ease of use; AT = attitude; SU = support; BI = behavioral intention.

Overall, users' flow in metaverse technology is a key prerequisite for the TAM, and user attitudes towards metaverse technology play a role in explaining their support for and behavioral intention to participate in metaverse tourism. Users' support for metaverse tourism is also an important direct predictor of behavioral intention. In addition, support partially mediates the relationship between attitude and behavioral intention.

5. Discussion and Conclusions

This paper modifies the TAM by incorporating the concept of metaverse flow, creating a model that integrates metaverse flow with the TAM. By examining both flow and technology perceptions, the study confirms users' attitudes to metaverse technology and explores its impact on support for metaverse tourism and behavioral intentions. It also validates the mediating role of metaverse tourism support and reveals the underlying mechanisms behind the shift from attitudes towards metaverse technology to intentions to engage in metaverse tourism, thus enhancing the explanatory power of the TAM in the context of metaverse tourism. The main conclusions are as follows:

First, flow is a positive emotional state that can have a positive impact on individual behavior. For individuals, metaverse flow represents their cognitive engagement with metaverse technology and metaverse tourism, which can spark curiosity and anticipation towards metaverse tourism. Flow can alleviate feelings of unfamiliarity and discomfort with new technology, stimulate positive emotions, and significantly enhance their perception of metaverse technology, leading to a more optimistic and positive assessment. Specifically, a higher degree of metaverse flow leads to a more positive assessment of technology, influencing perceptions of ease of use and usefulness. Unlike most previous studies, this paper demonstrates that flow acts as an antecedent factor affecting perceptions of ease of use and usefulness, showing strong explanatory power in the results. This conclusion addresses gaps in existing research and offers new perspectives for expanding the TAM. For developers and practitioners of metaverse technology, it is essential to provide virtual experiences that are as close to or beyond sensory dimensions, allowing users to fully enjoy and immerse themselves in the metaverse. This approach helps users experience the novel aspects of metaverse technology more intuitively and profoundly, further awakening their intrinsic interest and anticipation, enhancing their recognition of technology, and enhancing users' willingness to repeatedly use and engage in consumption with this technology.

Second, consistent with previous research findings, perceived usefulness and perceived ease of use are predictors of users' attitudes to metaverse technology. When users perceive new technology as easier to use and more useful, their attitude towards using metaverse technology becomes significantly more positive, which in turn enhances their support for metaverse tourism. Notably, in this study, perceived usefulness has a much stronger impact on usage attitudes than perceived ease of use. From the perspective of usefulness, metaverse technology can overcome limitations of time, space, and resources, saving costs associated with consumption and offering virtual experiences comparable to real ones. In immersive technologies, users often prioritize gaining novel experiences or reducing costs and improving efficiency. These factors help explain why, when users recognize the benefits metaverse technology can offer, they are more willing to overcome difficulties encountered during its use. This also explains why perceived usefulness has a far greater impact than ease of use in this context. In tourism, metaverse tourism eliminates spatial and temporal constraints, reducing the preparation, time, and money required for travel, and addresses issues such as accessibility, overcrowding, and long queues that affect the travel experience and satisfaction in traditional tourism. The immersive, super-sensory experience of metaverse tourism can provide new experiences that rival traditional on-site travel and can, to some extent, replace physical travel. The strong perception of technological usefulness makes users' attitudes towards metaverse technology more optimistic and positive and intensifies their expectations for metaverse tourism. Perceived ease of use refers to the cost and threshold of adopting metaverse technology, essentially, the level of convenience. When new technology is highly attractive, even a steep initial learning curve will not hinder the formation of a positive attitude. Moreover, as users spend more time with technology and gain experience, their proficiency with metaverse technology will increase, reducing the long-term impact of perceived ease of use on their attitudes. However, this does not mean that ease of use is unimportant. Therefore, developers of metaverse tourism platforms should focus on simplicity and convenience when designing products, such as intuitive and easy-to-use interfaces. In addition, they should enhance the appeal

of the product to attract users to immerse themselves and experience the new offerings of metaverse tourism more easily and directly. Concurrently, metaverse tourism practitioners should increase the promotion of metaverse tourism experiences to help users who cannot or do not wish to choose traditional travel to make up for their regrets, potentially creating superior virtual travel experiences and turning them into loyal consumers and advocates of metaverse tourism.

Third, metaverse tourism support plays an important mediating role between attitudes towards the metaverse and behavioral intentions. Metaverse tourism support acts as a black box in the mechanism linking attitudes towards metaverse technology with behavioral intentions in the context of metaverse tourism. A positive attitude towards metaverse technology (high quality, value, appeal, etc.) directly evokes users' curiosity and expectations for metaverse tourism, fostering intentions to engage in promotional behaviors such as recommending, sharing, and revisiting. Beyond this direct effect, attitudes have a stronger indirect effect on behavioral intentions through metaverse tourism support. A positive attitude towards metaverse technology stimulates users' support and emotional investment in the development of metaverse tourism, leading to proactive behaviors. This study confirms Kaplanidou and Vogt's [76] view that technology is a critical component in shaping tourist experiences and generating tourism behaviors. Attitudes to new technology in tourist destinations can meet tourists' expectations and determine tourism outcomes. Therefore, when developing and designing metaverse tourism products, it is crucial to fully understand the needs of tourists through interviews, surveys, and votes, leveraging the stimulating effect of new technology to enhance the user experience, increase recognition, and promote positive behaviors such as recommendations and repeat visits. The shift from smart tourism to metaverse tourism highlights that technology is a driving force for the future development of the tourism industry. Offering technology-driven tourism products represents a new direction for future tourism development. The unique value and benefits of metaverse tourism over traditional physical travel are receiving increasing attention.

6. Limitations and Future Research Agenda

The limitations of this study are as follows: First, our survey was conducted only in South Korea, so the findings may not be generalizable to other regions. Future research should broaden geographical coverage to enhance the generalizability of results. Second, this study was conducted during the COVID-19 pandemic, and results may differ as the impact of the pandemic diminishes or disappears. In addition, as metaverse technology continues to evolve and become more widespread, users' perceptions and proficiency with technology may change over time. Future research could benefit from comparisons across different time periods to gain deeper insights. Third, this study focused only on flow as a precursor variable in the TAM and did not consider other influencing factors. Future research could explore additional factors such as government policies, travel motivation, tourist knowledge, and cultural differences. Fourth, the significant mediating role of support between attitude and behavioral intentions, highlighted as a novel contribution, could be further expanded in future studies by incorporating moderating variables (e.g., travel experience) to explore their effects on mediating relationships. We could also extend this study to other tourism segments to examine the applicability of this mediating effect in different contexts. Finally, future studies could investigate the relationship between metaverse travel intentions and traditional tourism, which could provide valuable insights and deepen our understanding of how these two forms of tourism interact and influence one another.

Author Contributions: Methodology and writing, Q.W.; idea, data collection, and formal analysis, Q.W. and M.-Q.L.; review, editing, and supervision, J.-H.W. All authors have read and agreed to the published version of the manuscript.

Funding: The Research Foundation of the Education Bureau of Hunan Province, China. No. 21B0078. China Scholarship Council, grant number 202206720018.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding authors.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Dwivedi, Y.K.; Hughes, L.; Baabdullah, A.M.; Ribeiro-Navarrete, S.; Giannakis, M.; Al-Debei, M.M.; Dennehy, D.; Metri, B.; Buhalis, D.; Cheung, C.M.; et al. Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges opportunities and agenda for research practice and policy. *Int. J. Inf. Manag.* **2022**, *66*, 102542. [CrossRef]
2. Yang, F.X.; Wang, Y. Rethinking Metaverse Tourism: A Taxonomy and an Agenda for Future Research. *J. Hosp. Tour. Res.* **2023**. [CrossRef]
3. Koohang, A.; Nord, J.H.; Ooi, K.B.; Tan, G.W.-H.; Al-Emran, M.; Aw, E.C.-X.; Baabdullah, A.M.; Buhalis, D.; Cham, T.-H.; Dennis, C.; et al. Shaping the Metaverse into Reality: A Holistic Multidisciplinary Understanding of Opportunities Challenges and Avenues for Future Investigation. *J. Compu. Inf. Syst.* **2023**, *63*, 735–765. [CrossRef]
4. Gursoy, D.; Malodia, S.; Dhir, A. The metaverse in the hospitality and tourism industry: An overview of current trends and future research directions. *J. Hosp. Mark. Manag.* **2022**, *31*, 527–534. [CrossRef]
5. Lee, S.O.; Wu, Q.; Hyun, S.S. Hospitality and tourism experience in metaverse: An examination of users' behavior motivations and preferences. *J. Hosp. Mark. Manag.* **2024**, 1–17. [CrossRef]
6. Go, H.; Kang, M. Metaverse tourism for sustainable tourism development: Tourism agenda 2030. *Tour. Rev.* **2023**, *78*, 381–394. [CrossRef]
7. Jafar, R.M.S.; Ahmad, W. Tourist loyalty in the metaverse: The role of immersive tourism experience and cognitive perceptions. *Tour. Rev.* **2023**, *79*, 321–336. [CrossRef]
8. Zhang, J.; Quoquab, F.; Mohammad, J. Metaverse tourism and Gen-Z and Gen-Y's motivation: "Will you or won't you travel virtually?". *Tour. Rev.* **2023**, *79*, 304–320. [CrossRef]
9. Mandal, S.; Paul, J.; Kotni, V.D.P.; Chintaluri, M.G. The orientation of Gen Zs towards metaverse tourism. *J. Destin. Mark. Manag.* **2024**, *32*, 100871. [CrossRef]
10. Kraus, S.; Kumar, S.; Lim, W.M.; Kaur, J.; Sharma, A.; Schiavone, F. From moon landing to metaverse: Tracing the evolution of Technological Forecasting and Social Change. *Technol. Forecast. Soc. Chang.* **2023**, *189*, 122381. [CrossRef]
11. Smart, J.; Cascio, J.; Paffendorf, J.; Bridges, C.; Hummel, J.; Hursthouse, J.; Moss, R. A cross-industry public foresight project. In *Proc. Metaverse Roadmap Pathways 3DWeb*; World Wide Web Consortium: Cambridge, MA, USA, 2007; pp. 1–28.
12. Zhou, X.; Yang, Q.; Zheng, X.; Liang, W.; Wang, K.I.-K.; Ma, J.; Pan, Y.; Jin, Q. Personalized federation learning with model-contrastive learning for multi-modal user modeling in human-centric metaverse. *IEEE J. Sel. Areas Commun.* **2024**, *42*, 817–831. [CrossRef]
13. Cheng, R.; Wu, N.; Chen, S.; Han, B. Will metaverse be nextg internet? Vision hype and reality. *IEEE Netw.* **2022**, *36*, 197–204. [CrossRef]
14. Ratican, J.; Hutson, J.; Wright, A. A proposed meta-reality immersive development pipeline: Generative ai models and extended reality (xr) content for the metaverse. *J. Intell. Learn. Syst. Appl.* **2023**, 15. [CrossRef]
15. Louw, C.; Louw, B.L. The digital disruption of virtual reality and the future of the steel roller coaster: An initial industry analysis. *Afr. J. Hosp. Tour. Leis.* **2018**, *7*, 1–16.
16. Wreford, O.; Williams, N.L.; Ferdinand, N. Together alone: An exploration of the virtual event experience. *Event Manag.* **2019**, *23*, 721–732. [CrossRef]
17. Buhalis, D.; Lin, M.S.; Leung, D. Metaverse as a driver for customer experience and value co-creation: Implications for hospitality and tourism management and marketing. *Int. J. Contemp. Hosp. Manag.* **2022**, *35*, 701–716. [CrossRef]
18. Qureshi, M.I.; Khan, N.; Qayyum, S.; Malik, S.; Hishan, S.S.; Ramayah, T. Classifications of sustainable manufacturing practices in ASEAN region: A systematic review and bibliometric analysis of the past decade of research. *Sustainability* **2020**, *12*, 8950. [CrossRef]
19. Lin, L.P.L.; Huang, S.C.L.; Ho, Y.C. Could virtual reality effectively market slow travel in a heritage destination? *Tour. Manag.* **2020**, *78*, 104027. [CrossRef]
20. Tussyadiah, I.P.; Wang, D.; Jung, T.H.; Tom-Dieck, M.C. Virtual reality presence and attitude change: Empirical evidence from tourism. *Tour. Manag.* **2018**, *66*, 140–154. [CrossRef]
21. Koo, C.; Kwon, J.; Chung, N.; Kim, J. Metaverse tourism: Conceptual framework and research propositions. *Curr. Issues Tour.* **2023**, *26*, 3268–3274. [CrossRef]
22. Davis, F.D. Perceived Usefulness Perceived Ease of Use and User Acceptance of Information technology. *MIS Q.* **1989**, *13*, 319–340. [CrossRef]
23. Granić, A.; Marangunić, N. Technology acceptance model in educational context: A systematic literature review. *Br. J. Educ. Technol.* **2019**, *50*, 2572–2593. [CrossRef]

24. Salloum, S.A.; Alhamad, A.Q.M.; Al-Emran, M.; Monem, A.A.; Shaalan, K. Exploring students' acceptance of e-learning through the development of a comprehensive technology acceptance model. *IEEE Access* **2019**, *7*, 128445–128462. [CrossRef]
25. Kamal, S.A.; Shafiq, M.; Kakria, P. Investigating acceptance of telemedicine services through an extended technology acceptance model (TAM). *Technol. Soc.* **2020**, *60*, 101212. [CrossRef]
26. Fedorko, I.; Bacik, R.; Gavurova, B. Technology acceptance model in e-commerce segment. *Manag. Mark.* **2018**, *13*, 1242–1256. [CrossRef]
27. Oh, J.H. A study on factors affecting the intention to use the metaverse by applying the extended technology acceptance model (ETAM): Focused on the virtual world metaverse. *J. Korea Contents Assoc.* **2021**, *21*, 204–216.
28. Wu, R.; Yu, Z. Investigating users' acceptance of the metaverse with an extended technology acceptance model. *Int. J. Hum.-Comput. Interact.* **2023**, *40*, 5810–5826. [CrossRef]
29. Liu, H.; Park, K.S. Exploring the impact of metaverse tourism experiences on actual visit intentions: An integrated model of presence the Technology Acceptance Model and the Theory of Planned Behavior. *Int. J. Tour. Res.* **2024**, *26*, e2616. [CrossRef]
30. Csikszentmihalyi, M.; Csikszentmihalyi, M.; Abuhamdeh, S.; Nakamura, J. Flow. In *Flow and the Foundations of Positive Psychology: The Collected Works of Mihaly Csikszentmihalyi*; Springer: Dordrecht, The Netherlands, 2014; pp. 227–238.
31. Van-Roy, R.; Zaman, B. Need-supporting gamification in education: An assessment of motivational effects over time. *Comput. Educ.* **2018**, *127*, 283–297. [CrossRef]
32. Rodríguez-Ardura, I.; Meseguer-Artola, A. Flow experiences in personalised e-learning environments and the role of gender and academic performance. *Interact. Learn. Environ.* **2021**, *29*, 59–82. [CrossRef]
33. Wu, L.; Chiu, M.L.; Chen, K.W. Defining the determinants of online impulse buying through a shopping process of integrating perceived risk expectation-confirmation model and flow theory issues. *Int. J. Inf. Manag.* **2020**, *52*, 102099. [CrossRef]
34. Huskey, R.; Craighead, B.; Miller, M.B.; Weber, R. Does intrinsic reward motivate cognitive control? A naturalistic-fMRI study based on the synchronization theory of flow. *Cogn. Affect. Behav. Neurosci.* **2018**, *18*, 902–924. [CrossRef] [PubMed]
35. Ceja, L.; Navarro, J. Dynamic patterns of flow in the workplace: Characterizing within-individual variability using a complexity science approach. *J. Organ. Behav.* **2011**, *32*, 627–651. [CrossRef]
36. Wu, C.H.J.; Liang, R.D. The relationship between white-water rafting experience formation and customer reaction: A flow theory perspective. *Tour. Manag.* **2011**, *32*, 317–325. [CrossRef]
37. Zhang, Q.; Liu, X.; Li, Z.; Tan, Z. Multi-experiences in the art performance tourism: Integrating experience economy model with flow theory. *J. Travel Tour. Mark.* **2021**, *38*, 491–510. [CrossRef]
38. Hoffman, D.L.; Novak, T.P. Flow online: Lessons learned and future prospects. *J. Interact. Mark.* **2009**, *23*, 23–34. [CrossRef]
39. Gao, L.; Bai, X.; Park, A. Understanding sustained participation in virtual travel communities from the perspectives of is success model and flow theory. *J. Hosp. Tour. Res.* **2017**, *41*, 475–509. [CrossRef]
40. Kim, M.J.; Hall, C.M. A hedonic motivation model in virtual reality tourism: Comparing visitors and non-visitors. *Int. J. Inf. Manag.* **2019**, *46*, 236–249. [CrossRef]
41. Patil, K.P.; Pramod, D. 'Real Worlds Illusion!' Consumer Response to Metaverse Technology Applying Flow Theory. In Proceedings of the 2023 7th International Conference on Computing Communication Control and Automation (ICCUBEA), Pune, India, 18–19 August 2023; pp. 1–6.
42. Seo, H.; Yoh, E. The Effects of Flow in a Metaverse-based Virtual Brand Space on Satisfaction and Purchase Intention of Virtual and Actual Fashion Products. *J. Korean Soc. Cloth. Text.* **2023**, *47*, 891–906.
43. Hudson, S.; Matson-Barkat, S.; Pallamin, N.; Jegou, G. With or without you? Interaction and immersion in a virtual reality experience. *J. Bus. Res.* **2019**, *100*, 459–468. [CrossRef]
44. Hamari, J.; Shernoff, D.J.; Rowe, E.; Coller, B.; Asbell-Clarke, J.; Edwards, T. Challenging games help students learn: An empirical study on engagement flow and immersion in game-based learning. *Comput. Hum. Behav.* **2016**, *54*, 170–179. [CrossRef]
45. Huang, Y.C.; Li, L.N.; Lee, H.Y.; Browning, M.H.; Yu, C.P. Surfing in virtual reality: An application of extended technology acceptance model with flow theory. *Comput. Hum. Behav. Rep.* **2023**, *9*, 100252. [CrossRef]
46. Ahmad, N.; Abdulkarim, H. The impact of flow experience and personality type on the intention to use virtual world. *Int. J. Hum.–Comput. Interact.* **2019**, *35*, 1074–1085. [CrossRef]
47. Han, S.L.; An, M.; Han, J.J.; Lee, J. Telepresence time distortion and consumer traits of virtual reality shopping. *J. Bus. Res.* **2020**, *118*, 311–320. [CrossRef]
48. Yang, C.; Yan, S.; Wang, J.; Xue, Y. Flow experiences and virtual tourism: The role of technological acceptance and technological readiness. *Sustainability* **2022**, *14*, 5361. [CrossRef]
49. Ruangkanjanases, A.; Khan, A.; Sivarak, O.; Rahardja, U.; Chen, S.C. Modeling the Consumers' Flow Experience in E-commerce: The Integration of ECM and TAM with the Antecedents of Flow Experience. *SAGE Open* **2024**, *14*, 21582440241258595. [CrossRef]
50. Fishbein, M.; Ajzen, I. *Predicting and Changing Behavior: The Reasoned Action Approach*; Psychology Press: Hove, UK, 2011.
51. Marangunić, N.; Granić, A. Technology acceptance model: A literature review from 1986 to 2013. *Univers. Access Inf. Soc.* **2015**, *14*, 81–95. [CrossRef]
52. El-Said, O.; Aziz, H. Virtual tours a means to an end: An analysis of virtual tours' role in tourism recovery post COVID-19. *J. Travel Res.* **2022**, *61*, 528–548. [CrossRef]
53. Gursoy, D.; Jurowski, C.; Uysal, M. Resident attitudes: A structural modeling approach. *Ann. Tour. Res.* **2022**, *29*, 79–105. [CrossRef]

54. Nunkoo, R.; Ramkissoon, H. Small island urban tourism: A residents' perspective. *Curr. Issues Tour.* **2010**, *13*, 37–60. [CrossRef]
55. Lai, P.H.; Nepal, S.K. Local perspectives of ecotourism development in Tawushan Nature Reserve Taiwan. *Tour. Manag.* **2006**, *27*, 1117–1129. [CrossRef]
56. Lepp, A. Attitudes towards initial tourism development in a community with no prior tourism experience: The case of Bigodi Uganda. *J. Sustain. Tour.* **2008**, *16*, 5–22. [CrossRef]
57. Nicholas, L.N.; Thapa, B.; Ko, Y.J. Residents' perspectives of a world heritage site: The pitons management area st. Lucia. *Ann. Tour. Res.* **2009**, *36*, 390–412. [CrossRef]
58. Nunkoo, R.; Gursoy, D. Residents' support for tourism: An identity perspective. *Ann. Tour. Res.* **2012**, *39*, 243–268. [CrossRef]
59. Hyun, M.Y.; O'Keefe, R.M. Virtual destination image: Testing a telepresence model. *J. Bus. Res.* **2012**, *65*, 29–35. [CrossRef]
60. Chen, C.F.; Tsai, D. How destination image and evaluative factors affect behavioral intentions? *Tour. Manag.* **2007**, *28*, 1115–1122. [CrossRef]
61. Lusch, R.F.; O'Brien, M.; Sindhav, B. The critical role of trust in obtaining retailer support for a supplier's strategic organizational change. *J. Retail.* **2003**, *79*, 249–258. [CrossRef]
62. Gursoy, D.; Rutherford, D.G. Host attitudes toward tourism: An improved structural model. *Ann. Tour. Res.* **2004**, *31*, 495–516. [CrossRef]
63. Joo, D.; Xu, W.; Lee, J.; Lee, C.K.; Woosnam, K.M. Residents' perceived risk emotional solidarity and support for tourism amidst the COVID-19 pandemic. *J. Destin. Mark. Manag.* **2021**, *19*, 100553. [CrossRef]
64. Hamari, J.; Koivisto, J. Why do people use gamification services? *Int. J. Inf. Manag.* **2015**, *35*, 419–431. [CrossRef]
65. Ali, F.; Ryu, K.; Hussain, K. Influence of experiences on memories satisfaction and behavioral intentions: A study of creative tourism. *J. Travel Tour. Mark.* **2016**, *33*, 85–100. [CrossRef]
66. Bayih, B.E.; Singh, A. Modeling domestic tourism: Motivations satisfaction and tourist behavioral intentions. *Heliyon* **2020**, *6*, e04839. [CrossRef] [PubMed]
67. Churchill, G.A., Jr. A paradigm for developing better measures of marketing constructs. *J. Mark. Res.* **1979**, *16*, 64–73. [CrossRef]
68. Yao, Y.; Jia, G.; Hou, Y. Impulsive travel intention induced by sharing conspicuous travel experience on social media: A moderated mediation analysis. *J. Hosp. Tour. Manag.* **2021**, *49*, 431–438. [CrossRef]
69. Kucukusta, D.; Law, R.; Besbes, A.; Legohérel, P. Re-examining perceived usefulness and ease of use in online booking: The case of Hong Kong online users. *Int. J. Cont. Hosp. Manag.* **2015**, *27*, 185–198. [CrossRef]
70. Lu, J.; Xiao, X.; Xu, Z.; Wang, C.; Zhang, M.; Zhou, Y. The potential of virtual tourism in the recovery of tourism industry during the COVID-19 pandemic. *Curr. Issues Tour.* **2022**, *25*, 441–457. [CrossRef]
71. Lee, T.H. Influence analysis of community resident support for sustainable tourism development. *Tour. Manag.* **2013**, *34*, 37–46. [CrossRef]
72. Itani, O.S.; Hollebeek, L.D. Light at the end of the tunnel: Visitors' virtual reality (versus in-person) attraction site tour-related behavioral intentions during and post-COVID-19. *Tour. Manag.* **2021**, *84*, 104290. [CrossRef]
73. Gay, L.R.; Airasian, P.A. The Research Design. *Res. Method* **2007**. Available online: https://core.ac.uk/download/pdf/300827262.pdf (accessed on 19 September 2024).
74. Nunnally, J.C. An overview of psychological measurement. In *Clinical Diagnosis of Mental Disorders: A Handbook*; Springer: Boston, MA, USA, 1978; pp. 97–146.
75. Hair, J.F.; Sarstedt, M.; Ringle, C.M.; Mena, J.A. An assessment of the use of partial least squares structural equation modeling in marketing research. *J. Acad. Mark. Sci.* **2012**, *40*, 414–433. [CrossRef]
76. Kaplanidou, K.; Vogt, C. Do sport tourism events have a brand image. In Proceedings of the 2006 Northeastern Recreation Research Symposium, Bolton Landing, NY, USA, 9–11 April 2006; pp. 2–7.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.