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EXTENDING THE TECHNOLOGY ACCEPTANCE MODEL TO TOURISM VIRTUAL REALITY EXPERIENCES

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Abstract

Virtual reality (VR) is essential in advancing smart tourism. This study explores how perceived ease of use, perceived usefulness, and perceived enjoyment influence the intention to use VR, incorporating self-efficacy within an extended Technology Acceptance Model. Data were collected from 466 respondents in China with VR tourism experience. Structural equation modeling was applied to test the measurement and structural models. Findings indicate that perceived usefulness, ease of use, and enjoyment partially mediate the relationship between self-efficacy and VR usage intention. Notably, perceived enjoyment had the strongest impact on VR usage intention, followed by ease of use,

self-efficacy, and usefulness. The study concludes with theoretical and practical insights for both researchers and industry practitioners.

Keyword: perceived ease of use, perceived usefulness, perceived enjoyment, self-efficacy

Introduction

Virtual reality (VR) developed rapidly in recent years and has received considerable attention from researchers. This technology encompasses a range of advancements, such as computer graphics, multimedia, real-time tracking, and fusion display, and it has applications in areas including education, cultural heritage protection, medicine, the military, industrial maintenance, and multimedia communication (Iftikhar, Khan, & Pasanchay, 2023). The global VR market was estimated by International Data Corp to reach USD 162 billion in 2020, driven by investments from major technology companies worldwide (Chinese Internet Data Information Network, 2019). With capital promotion and intervention from leading technology companies, the application of VR has expanded across various fields, gaining popularity in recent years. VR manufacturers and R&D institutions that survived early industry challenges in 2016 and 2017 have developed rapidly since then. In China, 34 national-level cultural and technological integration demonstration bases have been established, effectively combining high-tech industrial development zones, sustainable development pilot zones, and modern service industry cities to form an integrated cultural and technological platform (Ministry of Culture and Tourism of the People's Republic of China, 2019).

In the tourism sector, VR technology has made significant contributions to transforming tourism marketing. Traditional e-commerce often lacks the ability to provide in-depth information about tourism products, a gap that VR technology addresses by enabling immersive, user-centric experiences (Yersüren & Özel, 2023; Lee, 2023). VR and augmented reality (AR) offer tourism businesses enhanced ways to present information, often surpassing traditional e-commerce capabilities in the quality and interactivity of information provided (Buhalis & Mamalakis, 2015). As the technology has evolved,

many tourist destinations have adopted VR for promotional materials beyond static photos or videos, using VR to create more engaging and immersive advertisements (Nayyar, Mahapatra, Le, & Suseendran, 2018). Studies have shown that VR advancements can enhance consumer immersion, improving attitudes toward advertisements and increasing willingness to purchase tourism services (Moorhouse, Dieck, & Jung, 2018). For example, research by Guttentag (2010) indicates that VR can help tourists better understand a destination's environment and offerings.

While previous research on VR in tourism primarily focuses on tourist experiences, recent studies emphasize the importance of understanding the antecedents that affect VR and AR experiences (Bretos, Ibáñez-Sánchez, & Orús, 2024). It has been reported that tourists' technology readiness significantly influences their perception of the usefulness of VR, especially when exploring heritage sites (Chung, Han, & Joun, 2015). Given these findings, personal factors, such as self-efficacy, have emerged as critical elements influencing users' acceptance of VR in tourism (Venkatesh, & Davis, 1996). Expanding on these insights, recent literature reveals that self-efficacy and enjoyment play crucial roles within the Technology Acceptance Model (TAM), shaping tourists' behavioral intentions and engagement with VR (Sinha, Dhingra, Sehrawat, Jain, & Himanshu, 2024). Therefore, this study explores the application of VR in China's tourism industry, including tourists' VR experiences, the impact of self-efficacy on their perceptions, and subsequent tourism behaviors.

Literature Review

VR in the Tourism Industry

Intangibility is one of the characteristics of tourism products, making it difficult for potential tourists to fully understand these offerings before participating in actual tourism activities. VR technology can address this challenge by enhancing tourism marketing through real-time simulations that allow users to navigate and interact in a three-dimensional (3D) computer- generated environment (Guttentag, 2010; Gutierrez, Vexo, & Thalmann, 2008; Jung, Chung, & Leue, 2015). This immersive quality of VR is particularly beneficial for tourism, as it provides an experience that enables potential tour-

ists to explore destinations virtually, fostering a more informed decision-making process (Yersüren & Özel, 2023).

Recently, Fetscherin and Lattemann (2008) proposed using the Technology Acceptance Model (TAM) to examine the use of 3D virtual worlds and emphasized that community factors, such as communication, collaboration, and cooperation, significantly influence user intention and acceptance in such environments. Expanding on this, Huang, Backman, Backman, and Chang (2016) combined TAM with self-determination theory to understand tourists' engagement with 3D virtual worlds and found that perceived usefulness, autonomy, and relatedness positively impact enjoyment and behavioral intentions (Huang et al., 2016). Such findings align with more recent studies indicating that VR in tourism fosters positive attitudes toward destinations through engaging and informative virtual experiences (Bretos et al., 2024; Kim & Hardin, 2010). Moreover, when users experience a state rich in interactivity and information, virtual experiences often prove more effective than traditional brochures for advertising purposes (Wan, Tsaur, Chiou, & Chiou, 2007).

Relationship between Self-efficacy, Perception, and Behavioral Intention

Self-efficacy is defined as people's belief in their abilities to affect their lives through their actions (Bandura, 1965; Kok, Den Boer, De Vries, Gerards, & Mudde, 2014). According to social cognitive theory, individuals with a stronger sense of self-efficacy set more challenging goals and exhibit a stronger commitment to achieving these goals (Bandura, 1989). In the context of technology adoption, self-efficacy is often viewed as an essential antecedent, significantly influencing both perceived ease of use and perceived usefulness, key constructs in the Technology Acceptance Model (TAM) (Stafford, (2005). Specifically, self-efficacy directly impacts users' ease of use and usefulness perceptions, which can further shape their behavioral intentions toward technology adoption (Wexler, 2001). In addition, attribution theory suggests that if the locus of perceived cause is internal, or dispositional, then self-esteem and self-efficacy are enhanced by success but diminished by failure (Kok et al., 2014). Thus, self-efficacy not only in-

fluences perception but also forms a core part of how individuals evaluate their interactions with technology.

The TAM provides a robust framework for understanding technology acceptance, initially positing that perceived ease of use and perceived usefulness drive attitudes toward technology (Marangunić, & Granić, 2015). Developed from the theory of reasoned action (Ajzen & Fishbein, 1980) and theory of planned behavior (Ajzen, 1985), TAM has evolved through numerous studies that have extended its application across diverse fields. For instance, perceived ease of use and usefulness are influenced by external factors such as technology anxiety (Saadé & Kira 2006), organizational support (Amoako-Gyampah & Salam, 2004), and individual confidence in using technology (Venkatesh, 2000). These factors underscore the importance of self-efficacy as a predictor of ease of use, as individuals' beliefs about their capabilities often determine their engagement with new technology (Venkatesh & Davis, 1996).

In tourism, the TAM framework has been expanded to account for the unique aspects of VR and AR technologies. Research by Yersüren and Özel (2024) identified that experiential quality significantly affects behavioral intention, with self-efficacy as a key determinant of perceived ease of use in VR contexts. Self-efficacy enables individuals to form efficacy beliefs based on both direct and indirect experiences, which influences their perception of VR as an accessible and enjoyable tool for virtual travel (Igbaria & Iivari, 1995). Furthermore, studies demonstrate that perceived enjoyment, a hedonic element especially relevant in VR tourism, often has a stronger impact on behavioral intention than ease of use or usefulness alone (Lee, 2023). Such findings emphasize the importance of enjoyment within the TAM framework, particularly in tourism where immersive experiences are highly valued.

As VR technology in tourism is predominantly experiential, recent research emphasizes that perceived value, including elements like aesthetics, playfulness, and the interactive quality of VR, contributes substantially to users' overall experience (Mathwick, Malhotra, & Rigdon, 2001). These elements create an intrinsic value that goes beyond task completion, aligning with TAM's focus on behavioral inten-

tion. In fact, Iftikhar, Khan, and Pasanchay (2022) showed that in the context of VR tourism, perceived enjoyment can enhance self-efficacy by making VR experiences more accessible and intuitive, thereby reinforcing the users' confidence in their ability to navigate VR environments effectively. Additionally, Sinha et al. (2024) highlighted that self-efficacy directly affects perceived ease of use and indirectly influences system usage through perceived usefulness, emphasizing the complex interplay between self-efficacy and perception within TAM.

Given these insights, extending the TAM to incorporate behavioral intention as a variable influenced by both perceived usefulness and enjoyment provides a more comprehensive framework for studying VR adoption in tourism. For example, TAM2, an extension of the original TAM, suggests that both perceived ease of use and usefulness influence users' intentions, which in turn, impacts actual usage behavior (Venkatesh & Davis, 2000). Recent applications of TAM2 in tourism VR highlight that system quality and supportive environments enhance users' perceived ease of use and usefulness, ultimately influencing their intention to engage with VR (Bretos et al., 2024).

In light of this framework, the following hypotheses are proposed to examine the relationship between self-efficacy, perception, and behavioral intention in VR tourism:

Hypothesis 1: Self-efficacy significantly influences perceived ease of use of VR.

Hypothesis 2: Self-efficacy significantly influences perceived usefulness of VR.

Hypothesis 3: Self-efficacy significantly influences perceived enjoyment of VR.

Hypothesis 4: Users' perceived ease of use significantly influences intention to use VR.

Hypothesis 5: Users' perceived usefulness significantly influences intention to use VR.

Hypothesis 6: Users' perceived enjoyment significantly influences intention to use VR.

Hypothesis 7: Self-efficacy significantly influences intention to use VR.

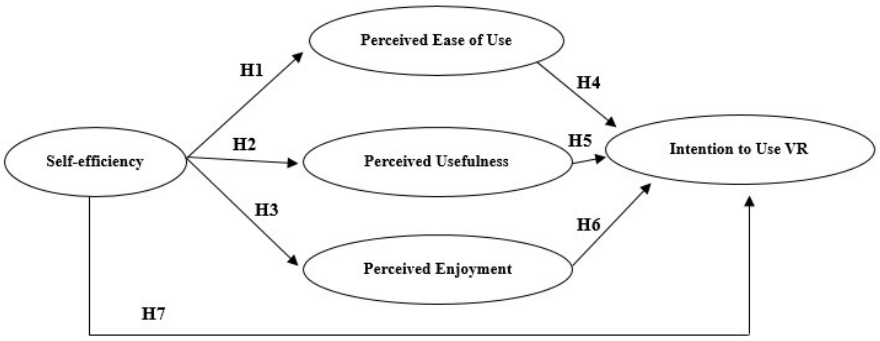

Figure 1. Research model

Method

Survey Instrument

For the self-efficacy dimension, this study adopted five items from the original scale by Schwarzer, Bäßler, Kwiatek, Schröder, & Zhang (1997) and adapted them to suit VR/AR experiences in tourism, modifying specific wordings as needed (e.g., "When I encounter challenges in collecting travel information, I am typically able to find a solution".). For the ease of use and perceived usefulness dimensions, the study utilized items from Davis's (1989) TAM scale (Davis, 1989), modifying them to address VR-specific contexts, such as ease of watching VR videos or the usefulness of VR for understanding tourist area appearances (Yersüren & Özel, 2024). For perceived enjoyment, the scale was based on items previously used in studies on VR technology in tourism, with four items adapted to measure enjoyment in VR experiences (e.g., "Watching VR videos is a pleasant experience".).

To measure the intention to use VR in tourism, this study adapted four items from the literature, such as "I intend to use VR to gather information about travel destinations in the future". All items were scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), consistent with prior studies in TAM and tourism VR applications (Sinha et al., 2024). A pilot test was conducted to evaluate the questionnaire's clarity and validity. Random arithmetic or text

questions were embedded to ensure respondent attention and validity of responses, with an appropriate answering time window (5 to 30 minutes). Three faculty members from the tourism program reviewed and provided feedback, leading to minor wording revisions. The pilot yielded 54 valid questionnaires, achieving a reliability score above 0.8 for all variables, indicating satisfactory internal consistency (Nunnally, 1959).

Data Collection and Analysis

Data collection was conducted through the online survey platform Wenjuanxing, targeting individuals with VR travel video experience. The survey was open from April 3 to April 27, 2024, and a total of 466 valid responses were obtained, which provides an adequate sample size for structural equation modeling (SEM) (Hair, Black, Babin, & Anderson, 2010). The sample consisted of 52.1% male and 47.9% female respondents, predominantly in the 31–40 age group, with 87.8% holding a bachelor's degree or higher. Table 1 details the participants' demographics.

The data analysis process encompassed five stages. First, normality checks and outlier detection were conducted, revealing no significant outliers and a generally normal distribution. Next, exploratory factor analysis (EFA) identified underlying constructs. Smart PLS 2.0 was employed to assess the reliability and convergent validity of each construct, with confirmatory factor analysis demonstrating high composite reliability and average variance extracted (AVE) scores in line with recommended thresholds (Hair et al., 2010). LISREL 8.70 was used to evaluate the measurement and structural models, while SEM analysis tested hypotheses related to the mediating roles of perceived ease of use, perceived usefulness, and perceived enjoyment in influencing behavioral intention in VR.

Results

EFA

Exploratory Factor Analysis (EFA) was conducted to identify the underlying dimensions of the study's constructs, using principal component analysis with the varimax rotation method. SPSS 19.0 software was employed for the analysis, examining the

results of the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity to verify the sample's adequacy for factor analysis. The KMO value achieved was 0.864, indicating an acceptable level of sampling adequacy. Bartlett's test was also significant (df = 253, p = 0.000), confirming the suitability of the data for factor analysis (Hair et al., 2010).

Table 1. Demographic profile of respondents

Characteristics	Group	%
Gender	Male	52.1
	Female	47.9
Age	20 years and below	23.4
	21–30 years	26.4
	31–40 years	40.3
	41 years and above	9.9
Education	High school and below	3.6
	Bachelor's degree	87.8
	Master's degree and/or Ph.D.	8.6
Income (CNY)	5,000 and below	27.4
	5,001–10,000	45.1
	10,001–15,000	23.4
	15,001 and above	4.1
VR Equipment	VR full-face helmet	13.7
	VR glasses	53.2
	Phone or tablet	25.3
	Computer	4.7
	Other electronic equipment	3.0

Items with an eigenvalue equal to or greater than one were considered significant and were retained for further analysis (Kaiser, 1960). This procedure yielded a five-factor model aligning with previous research in VR and TAM studies (Yersüren & Özel, 2024). The factors identified included self-efficacy, which explained 27.096% of the variance; perceived usefulness, which explained 10.384% of the variance; perceived enjoyment, accounting for 8.396% of the variance; intention to use VR, explaining 6.158% of the variance; and perceived ease of use, explaining 5.939% of the variance (see Table 2). Each factor reflects a core component of the modified TAM model adapted for VR technology in tourism, supporting the reliability of these dimensions

in capturing users' behavioral intentions and perceptions within VR contexts (Lee, 2023; Iftikhar, Khan, & Pasanchay, 2022).

No items were removed during the analysis, as all demonstrated sufficient factor loadings consistent with the proposed measurement model. This five-factor structure provides a solid foundation for examining the relationships between self-efficacy, ease of use, usefulness, enjoyment, and behavioral intention in VR tourism applications, aligning with recent research findings that emphasize the experiential and functional aspects of VR technology (Sinha et al., 2024).

Measurement Model Analysis

A series of fit indices was calculated for the dimensions (i.e., self-efficacy, perceived usefulness, perceived enjoyment, intention to use VR, and perceived ease of use) to evaluate the measurement model. The findings demonstrated an acceptable model fit, with the chi-square statistic yielding $X^2/df = 1.996$, indicating a good fit between the model and the observed data. Other fit indices also confirmed the model's adequacy, including the Root Mean Square Error of Approximation (RMSEA) at 0.046, Goodness of Fit Index (GFI) at 0.99, Comparative Fit Index (CFI) at 0.94, Normed Fit Index (NFI) at 0.97, Relative Fit Index (RFI) at 0.96, and Incremental Fit Index (IFI) at 0.99.

Composite reliability (CR) was calculated to assess the reliability of the measurement scales for each dimension, with all CR values exceeding the recommended threshold of 0.8, confirming satisfactory reliability and internal consistency (Hair et al., 2010). This level of reliability aligns with recent studies in VR tourism applications, indicating that the measurement items are consistent in capturing the constructs of self-efficacy, usefulness, enjoyment, and behavioral intentions (Yersüren & Özel, 2024; Sinha et al., 2024). Validity was assessed through the Average Variance Extracted (AVE) values. As shown in Table 3, all dimensions had AVE values above the recommended minimum of 0.5, indicating adequate convergent validity and confirming that the items for each construct reliably measure the same concept (Fornell & Larcker, 1981).

Table 2. Principal component analysis

Measurement Items	Factor Loadings				Eigenvalue	Explained Variance (%)
Factor 1					6.232	27.096
Self-efficacy 1	0.707					
Self-efficacy 2	0.786					
Self-efficacy 3	0.808					
Self-efficacy 4	0.799					
Self-efficacy 5	0.683					
Factor 2					2.388	10.384
Perceived usefulness 1		0.785				
Perceived usefulness 2		0.809				
Perceived usefulness 3		0.777				
Perceived usefulness 4		0.812				
Factor 3					1.931	8.396
Perceived enjoyment 1			0.704			
Perceived enjoyment 2			0.725			
Perceived enjoyment 3			0.730			
Perceived enjoyment 4			0.701			
Factor 4					1.416	6.158
Intention to use VR 1				0.711		
Intention to use VR 2				0.701		
Intention to use VR 3				0.540		
Intention to use VR 4				0.539		
Factor 5					1.366	5.939
Perceived ease of use 1				0.643		
Perceived ease of use 2				0.811		
Perceived ease of use 3				0.787		

Table 3. Measurement model

Construct	*M*	*SD*	Standardized Loading	CR	AVE
Self-efficacy				0.889	0.617
I am able to gather travel information if I choose to	3.84	0.805	0.790		
I can find relevant information even when available travel details are limited.	3.50	0.868	0.731		
With effort, I am confident I can obtain the information I need.	3.92	0.850	0.779		
When I encounter challenges in collecting travel information, I am typically able to find a solution.	3.76	0.805	0.816		
I can handle these challenges calmly, trusting in my ability to manage them.	4.00	0.795	0.808		
Perceived ease of use				0.829	0.620
I believe VR can be experienced at any time.	3.80	0.806	0.831		
I feel that VR can be used with minimal effort.	3.63	0.974	0.700		
Watching VR videos feels very straightforward to me.	3.94	0.857	0.823		
Perceived usefulness				0.902	0.697
VR makes it easy to understand the visual aspects of a tourist area.	4.17	0.770	0.826		
VR expands my options for gathering travel information.	4.11	0.769	0.842		
Using VR enhances the effectiveness of my travel information collection.	4.04	0.778	0.835		
VR is a valuable tool for collecting travel information.	4.16	0.779	0.837		
Perceived enjoyment				0.849	0.585
Watching VR videos is enjoyable for me.	4.25	0.702	0.761		
I feel excited when watching VR videos.	3.96	0.781	0.760		
Watching VR videos is a pleasant experience.	4.09	0.671	0.805		
Watching VR videos is a fun activity for me.	4.32	0.655	0.741		
Intention to use VR					

Construct	*M*	*SD*	Standardized Loading	CR	AVE
I intend to use VR to gather information about travel destinations in the future.	3.69	0.899	0.740	0.800	0.504
I plan to use VR regularly for travel destination information.	3.81	0.839	0.794		
Given the opportunity, I would like to use VR to receive information about travel destinations.	3.99	0.727	0.739		
If given the chance, I anticipate using VR to obtain information about travel destinations in the future.	3.71	0.805	0.642		

These findings reinforce the model's applicability in VR contexts, in determining behavioral intention and user acceptance (Lee, 2023). The measurement model supports further examination of the relationships between VR technology acceptance variables, underscoring the relevance of perceived usefulness, ease of use, and enjoyment in tourism VR adoption.

Structural Model Analysis

SEM analysis was conducted to test the proposed hypotheses and assess the relationships between self-efficacy, perceived ease of use, perceived usefulness, perceived enjoyment, and intention to use VR. The results indicated a satisfactory model fit, with key fit indices meeting or exceeding recommended thresholds: RMSEA = 0.046, GFI = 0.99, CFI = 0.94, NFI = 0.97, RFI = 0.96, and IFI = 0.99. These values indicate that the model fits the data well and supports the reliability of the structural paths, aligning with recent VR adoption studies that emphasize fit indices in validating user experience models (Yersüren & Özel, 2024; Lee, 2023). The SEM results demonstrated that self-efficacy significantly influenced perceived ease of use (path coefficient = 0.215), perceived usefulness (path coefficient = 0.376), and perceived enjoyment (path coefficient = 0.303). These findings are consistent with the Technology Acceptance Model (TAM), where self-efficacy enhances user perceptions of usability and usefulness, especially in interactive and experiential settings such as VR tour-

where factors like perceived enjoyment and self-efficacy play significant roles

ism (Iftikhar et al., 2022).

Furthermore, perceived ease of use (path coefficient = 0.227), perceived usefulness (path coefficient = 0.265), and perceived enjoyment (path coefficient = 0.265) all had significant effects on intention to use VR. This result supports the extension of TAM to include enjoyment as a critical factor in VR adoption, underscoring the importance of hedonic value in users' technology acceptance, particularly in the tourism sector where engagement and enjoyment drive behavioral intention (Sinha et al., 2024). Finally, self-efficacy was found to have a significant direct impact on intention to use VR, further validating its role as an essential factor in TAM extensions. These findings reinforce recent research showing that higher self-efficacy leads to greater confidence in navigating and using VR, thereby enhancing the likelihood of technology adoption in tourism (Lee, 2023). Thus, all the hypotheses were supported, confirming the structural relationships proposed in this study.

Mediating Role of Perceived Ease of Use, Perceived Usefulness, and Perceived Enjoyment

The mediating effects of perceived ease of use, perceived usefulness, and perceived enjoyment were assessed using bias-corrected and accelerated bootstrap estimation, an approach known for providing accurate confidence intervals (CIs) for indirect effects. Following established best practices, the sample was resampled 5,000 times with replacements, generating 5,000 indirect effect estimations to ensure robustness and reliability in the mediation analysis (MacKinnon, Lockwood, & Williams, 2004). This method aligns with recent studies that use bootstrap estimation in structural equation modeling to capture indirect effects accurately, particularly in models evaluating technology acceptance and user experience (Hair et al., 2010).

The results revealed that the indirect effect did not contain zero within the 95% confidence interval, confirming that the mediating effects of perceived ease of use, perceived usefulness, and perceived enjoyment were significant. These findings suggest that these constructs play a crucial mediating role in the relationship between self-efficacy and intention to use VR, reinforcing previous research on the Technology Acceptance Model (TAM),

which highlights the importance of perceived ease of use and enjoyment in shaping behavioral intention in VR tourism (Sinha et al., 2024; Yersüren & Özel, 2024).

This analysis underscores the influence of enjoyment and usefulness as critical components within TAM, especially in immersive technologies like VR, where hedonic and utilitarian aspects jointly influence adoption. These mediating relationships support a more comprehensive understanding of how VR can engage users, making it a valuable tool in enhancing user intention and satisfaction in tourism settings (Lee, 2023) (see Table 5).

Table 5. Mediating Role Of Perceived Ease Of Use, Perceived Usefulness, And Perceived Enjoyment

Path	Estimate	*P* value	CI	Results
Self-efficacy→Perceived ease of use→Intention to use VR				
Direct effect	0.2811	< 0.05	0.2089–0.3533	Partial mediation
Indirect effect	0.0721	< 0.05	0.0435–0.1076	
Total effect	0.3532	< 0.05	0.2785–0.4279	
Self-efficacy→Perceived usefulness→Intention to use VR				
Direct effect	0.2730	< 0.05	0.1955–0.3506	Partial mediation
Indirect effect	0.0802	< 0.05	0.0426–0.1259	
Total effect	0.3532	< 0.05	0.2785–0.4279	
Self-efficacy→Perceived enjoyment→Intention to use VR				
Direct effect	0.2543	< 0.05	0.1822–0.3264	Partial mediation
Indirect effect	0.0989	< 0.05	0.0635–0.1395	
Total effect	0.3532	< 0.05	0.2785–0.4279	

Discussion and Conclusions

The application of VR technology in the tourism industry remains an underexplored area in current research. This study addresses this gap by extending the Technology Acceptance Model (TAM) to examine potential tourists' travel decision-making. By integrating perceived enjoyment into the model, the study highlights VR technology's unique contributions to tourism and explores the role of self-efficacy within TAM, thus enriching the understanding of VR's impact on user acceptance in the tourism context (Yersüren & Özel, 2024; Sinha et al., 2024).

Effects of Self-efficacy on Perceived Ease of Use, Perceived Usefulness, and Perceived Enjoyment

This study reinforces the pivotal role of self-efficacy in influencing perceived ease of use and perceived usefulness, supporting previous findings (Igbaria & Iivari, 1995; Venkatesh & Davis, 1996). Furthermore, it finds that self-efficacy significantly affects perceived enjoyment, aligning with recent research that underscores the importance of confidence in navigating immersive VR environments (Iftikhar, Khan, & Pasanchay, 2022). However, this conclusion diverges from studies suggesting that emotional support plays a more direct role in self-efficacy (Lee & Lee, 2012). Self-efficacy, defined as an individual's belief in their ability to succeed in specific situations, impacts their thoughts, behaviors, and emotions (Bandura, 1989). When individuals engage deeply with VR technology, their sense of self-efficacy is enhanced, leading to a more authentic and enjoyable experience of the tourism destination's features (So, Kim, & Oh, 2020). This increased identification fosters a pleasant VR experience, as users feel more immersed and positively engaged (Lee, 2023).

The study also reveals that self-efficacy most strongly influences perceived usefulness, followed by perceived enjoyment and perceived ease of use, indicating that confidence in using VR technology can lead to more positive user outcomes. This extension of TAM to include perceived enjoyment due to self-efficacy provides a nuanced perspective, suggesting that higher self-efficacy fosters a greater sense of enjoyment and immersion in VR experiences (Yersüren & Özel, 2024).

Effects of Perceived Ease of Use, Perceived Usefulness, and Perceived Enjoyment on Intention to Use VR

Intention to use VR technology is a significant predictor of future travel decisions, echoing findings from previous studies on online shopping and digital platforms (Marangunić & Granić, 2015; Moorhouse et al., 2018; Wexler, 2001). In this study, perceived enjoyment emerged as the most influential factor on intention to use VR, followed by ease of use, self-efficacy, and perceived usefulness. This finding aligns with Ramayah and Ignatius's (2005) results, indicating a positive relationship between ease of use and behavioral intention, but contrasts with studies that found no significant link between usefulness and intention. This inconsistency may reflect users' differing priorities across virtual platforms; for instance, users may prioritize ease of use and engaging content over functional aspects (Gebhard, 1948).

For tourism marketers aiming to boost customers' intention to use VR, it is recommended to first create a perception of VR as an enjoyable experience that highlights the destination's entertainment value. Reducing operational complexity and providing user support can further enhance ease of use, and VR content can offer detailed and useful information on tourism resources, encouraging users to adopt VR technology for trip planning (Sinha et al., 2024).

Limitations and Future Research Directions

While this study offers valuable insights, it has several limitations. First, it focuses on the perceptual and experiential aspects of VR without setting limits for repeated exposure to the same destination. Future research could address this by focusing on a single VR channel or specific destination to analyze outcomes more precisely. Additionally, although previous studies have explored self-efficacy's antecedents (McFarland & Hamilton, 2006), there is a lack of confirmatory research supporting VR technology's application in tourism. Future studies might examine factors influencing users' self-efficacy specifically within VR contexts, particularly in tourism.

Another area for further research involves examining variations in VR use behaviors across demographics, such as age, gender, and income levels. As current VR research often emphasizes practical and emotional experiences, there is a need to investigate whether VR can simulate real-world travel constraints (e.g., weather, food, or accessibility), as these factors may influence travel intentions (Wong &

Kuo, 2021). If VR tourism experiences can simulate and inform users about such constraints, this may positively influence travel planning and future intentions (Lee, 2023).

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