

UNDERSTANDING XR TECHNOLOGY ACCEPTANCE BY PHYSICALLY DISABLED TOURISTS IN MUSEUMS

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Abstract

Purpose – This study aims to investigate the effects of XR technologies on the behavioral intentions of disabled tourists using a modified Technology Acceptance Model (TAM).

Design – The model includes perceived trust, perceived control, perceived efficacy, and perceived enjoyment as determinants of technology acceptance by disabled tourists. The hypotheses derived from the literature were empirically tested.

Methodology/Approach – The proposed model was tested by collecting data from 640 disabled tourists in Iran over a six-month period. An online survey was answered after watching two videos, representing the application of VR and AR. A quantitative method was applied, the PLS-SEM method was conducted to analyze the data.

Findings – The model was significantly supported by the results on the determinants of attitudes of people with disabilities toward XR technology. Other than the effect of perceived efficiency on PEOU, all the hypotheses were supported, demonstrating the positive effects of each of factors on the attitudes of disabled tourists and their behavioral intentions towards XR technology.

Originality of the research – This study significantly expands the academic knowledge on the fundamental factors affecting behavioural intentions of disabled tourists, as 15% of the world's population. This is the first study to investigate these factors in relation to the disabled tourists and XR technologies. This study will provide insight to marketers and stakeholders on the behavioral intentions of disabled tourists.

Keywords Physically Disabled Tourists, Technology Acceptance Model, XR Technology, Virtual Reality, Augmented Reality, Heritage tourism, Museums

INTRODUCTION

Cultural heritage tourism is increasing globally with approximately 40% of tourists distinguishing themselves as “cultural travelers” (UNWTO 2017). Accordingly, museums are a powerful economic tool in the cultural heritage tourism of developing countries (Perera 2013). According to Chen and Chen (2012), understanding heritage tourist behavior can facilitate effective development of this field. This includes understanding perceptions and attitudes of disabled tourists or differently abled tourists, which can be a potential market for inclusive tourism (Emrouzeh et al. 2017) and cultural heritage tourism (Goodall 2006; Güvenbaş and Polay 2019; Piechotka et al. 2017). In the past few years, accessible tourism for disabled people has become a growing concern noting that the accessible tourism market is huge as the number of people with disabilities only

in the European Union, easily exceeds 127 million tourists. (Cockburn-Wooten and McIntosh 2020). Furthermore, human rights advocates have noted that disabled people should have the same rights as able tourists, comprising 15% of the world population (Agovino et al. 2017).

At any given destination, museums are a premier attraction (Stylianou-Lambert 2011). However, government support for museums has declined considerably, and the challenging economic environment has led to financial issues and difficulty in offering unique experiences to tourists (He et al. 2018). Salek Farokhi (2019) emphasized that without technology, cultural tourism infrastructure and museums will underperform. Using technology to develop museum services can attract potential tourists (Asadi 2011). Many people increasingly and comfortably interact with technology, so museums must consider new ways to use technology to attract tourists and encourage them to visit (Vaz et al. 2018). X reality (XR) technologies, including Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR), are emerging technologies that can serve museums and cultural heritage tourism (Bae et al. 2020).

Tourist's experience with technology has had both positive and negative effects on their perceptions and behavioral intentions (Jeong and Shin 2019). Disabled tourists are no exception. Considering this, as Yung and Khoo-Lattimore (2019) noted, researchers should focus on the benefits of virtual tourism for disabled travelers and tourists who are physically disabled or have other constraints. Disabled people have different needs in using new technologies (Randolph and Hubona 2014). Sheehy et al. (2019) found that technologies like AR can influence the behavior of disabled tourists. When people with mobility disabilities use VR or AR, they may react either positively or negatively (Flavián et al. 2019; Van Kerrebroeck et al. 2017). A positive attitude toward technology can lead to revisits as well as recommendations by word of mouth to other people with disabilities (Melian et al. 2016). One benefit of these technologies is that the disabled can free themselves from their bodily restrictions in a brain-stimulated environment (Loureiro et al. 2020). Therefore, effective management of technologies can attract disabled tourists (Zhang and Yang 2021), and these technologies can be a significant help for the challenges disabled tourists face (Shore et al. 2018). According to the scholars, immersive technologies have great potential to facilitate the disabled people with new skills, decrease the impact of disabilities on their daily activities (Lang et al. 2014) and reduce their need to be dependent on others (Owuor et al. 2018) while visiting museums. Also, for instance, VR provides individuals with disabilities a safe access to simulated environments that they might not be able to access easily because of their physical limitations (Maran et al. 2022).

Interestingly, far too little attention has gone to understanding how behavioral intentions of disabled tourists are affected by these technologies (Rosenbaum and Ramirez 2022; Werner and Shpigelman 2019), specifically in cultural heritage sites like museums. Furthermore, the literature has reported very little on how these technologies influence the disabled in their travel decisions. Although a Technology Acceptance Model (TAM) can show the theoretical frameworks that explain how the disabled make decisions based on assistive technological devices (Shore et al. 2018), no research has used and extended TAM to examine how disabled heritage tourists adopt such technologies (Yung and Khoo-Lattimore 2019). Accordingly, this research uniquely aims to fill this gap by investigating the effects of the new trend of XR technologies on the attitudes and behaviors of disabled tourists in the field of cultural heritage tourism.

In other words, according to the previous studies, research on the acceptance of extended realities in the tourism attractions and predicting behaviour of tourists towards using them is still at the preliminary stage (Gharibi 2020) specifically, in disability tourism. Thus, this study expands the academic knowledge on the behaviour of disabled tourists towards these technologies to find what factors increases their intentions to use these technologies in museums. Although, previous studies have developed TAM models of tourist attitudes toward technology, this study is the first to develop a conceptual framework for how disabled tourists accept technology.

1. LITERATURE REVIEW

1.1. Applying XR Technologies to Cultural Heritage Tourism

Extended reality (XR) has vastly altered the way humans interact, connect, and learn by connecting the physical world to a digital one (Rauschnabel et al. 2017). XR is an umbrella term that encompasses VR, AR, and MR (Chuah 2019). VR refers to “computer-generated environments that replicate places, presence of people and objects, or fictional worlds, allowing realistic sensory experiences by the full immersion in a digital environment” (Vaz et al. 2018, p. 39), whereas AR combines the digital and real worlds as it brings digital information to real objects. Both technologies combined constitute MR, which is more immersive (Chuah 2019). These technologies have been implemented to enhance interaction and immersion in fields from cultural heritage tourism to museums (Vaz et al. 2018).

Kirshenblatt-Gimblett (1998) stated, “Cultural heritage and tourism are collaborative industries; heritage converting locations into destinations and tourism making them economically viable as exhibits themselves (p.151).” Using technology in museums can enhance visitor experiences, improve the educational role of museums, and deliver valuable information to visitors (Buljubašić et al. 2016). These technologies include wearable technologies that use both virtual and augmented realities (Hammady et al. 2019b; Trunfio and Campana 2020). Visitors can wear XR portable digital devices like sensors and glasses, which integrate and perform creative tasks (Freeman et al. 2016) emphasized that advances in these technologies increases accessibility and enables disabled individuals, whether physical (Bernardo 2016) or with other disabilities, to have more satisfying visits to museums. However, the behavioral intention of disabled visitors toward such technologies has not yet been defined.

1.2. Technology Acceptance Model (TAM) and Disabled Visitors

The TAM, developed by Davis in 1986, is a popular model for predicting the behavior of technology users. The power of TAM has been proven in predicting whether users will adopt and use technology and explaining how that technology can be used (Taherdoost 2018). Jung, (2019) argued that using external variables is crucial in TAM research to ensure the applicability of this model in different contexts. Therefore, most researchers have extended this model by adding external variables (Leue et al. 2014). In the field

of urban heritage tourism, researchers have also added external factors of information quality and facilitating conditions to the original TAM to propose a TAM that explains tourist behavioral intentions toward AR technology (tom Dieck and Jung 2018). In applying TAM to persons with disabilities, Theodorou and Meliones (2019) highlighted that the original TAM factors do not consider disabled users; external factors influencing perceived usefulness and perceived ease of use must be added to TAM to explore the behavior of the disabled using technology. Previous scholars have highlighted that those disabled users of technology require systematic assessment of technology to improve acceptance and use. Therefore, scholars have re-examined TAM in light of the needs of disabled users and expanded TAM by adding perceived information accessibility as a potential key determinant for ease of use and usefulness of the web for people with disabilities (Theodorou and Meliones 2019). Researchers who have adopted TAM to investigate perceived usefulness and perceived ease of use among the disabled have stated that this population faces challenges in adopting technologies in various fields; therefore, external factors need to extend TAM for them (Zahid et al. 2013).

1.3. Disabled Visitors and Their Behavior towards XR Technologies

As stated by the World Health Organization (WHO) (1980), disability is “any restriction or lack (resulting from any impairment) of ability to perform an activity in the manner or within the range considered normal for a human being.” In tourism, according to Allan (2013), disabled people engage in tourism activities based on their motivations and intentional behaviors. In the planned behavior theory (Ajzen 1991), behavioral intention is the best way to predict tourist behavior (Moutinho 1987) and a background for their real behavior (Casaló et al. 2017). Disabled tourist behavioral intentions include the extent to which they have determined to perform a certain behavior (Tsai 2010). In the literature, behavioral intentions of disabled tourists toward tourist destinations (Tsai 2010), religious sites (Melian et al. 2016), accommodation services (Navarro et al. 2015), air transport services (Chang and Chen 2012), travel agencies (McKercher et al. 2003), and leisure activities (Kastenholz et al. 2015) have been studied. Moreover, tourist behavioral intentions in the context of VR (Bafadhal and Hendrawan 2019; Oakley 2019) and AR (Chung et al. 2017; Hassan and Ramkissoon 2016) has also been investigated. These studies have shown that how well these technologies perform is important in tourist behavior. Tourist experience using technology as “try-before-you-buy experiences” (Flavián et al. 2019) has both a positive and negative effect on their behavioral intentions (Jeong and Shin 2019). According to (Kim et al. 2020), tourists with VR experience of a destination are attracted to that destination and tend to visit it. VR tourism behaviors include getting more information about the destination (Huang et al. 2016), desire to visit the destination in the future (Kim et al. 2020), and desire to revisit the destination (Kim et al. 2020). Researchers have noted that VR technology, by creating a unique experience, will attract more tourists and influence their behavioral intentions in theme parks (Oakley 2019). In another study, Kim et al. (Kim et al. 2020) found that embedded tools such as VR technology influence tourist behavioral intentions. Researchers have also shown that virtual tourism experiences (physical and psychological presence) influence their behavior by changing the attitudes of tourists (Bafadhal and Hendrawan 2019).

People with disabilities have less opportunity to participate in tourism activities, so experience with virtual technology might be enjoyable (Weiss et al. 2003). Thus, effective management of technologies can potentially attract disabled tourists (Zhang and Yang 2019). The relationship between technology and disabled tourists at heritage sites should be examined both theoretically and practically. Discovering the optimal combination of AR and MR in tourism and understanding its impact on disabled tourists will not only be an overall advantage in heritage tourism but will also increase the quality of travel for disabled tourists. According to Hassan and Ramkissoon (2016), the use of AR technology in museums contributes to the marketing and branding of museums, giving them a competitive advantage. They believe that AR technology in museums will revolutionize visitor experience and increase re-visit and WOM recommendations. Chung et al. (2017) argued that AR, used as a tool to provide better experiences for visitors at cultural heritage sites, can increase their satisfaction and positive behavioral intentions. However, cultural heritage centers have not followed up on ways to encourage disabled tourists (Partarakis et al. 2016).

2. HYPOTHESES DEVELOPMENT

2.1. Perceived Control and XR technology's PEOU and PU

Schröder et al. (2007) considered “perceived control” as one of the fundamental predictors of disabled people’s activities. They suggest enhancing perceptions of control might enhance perceived performance of activities, even without making changes in impairment. Some researchers have highlighted the impact of perceived control on acceptance for emerging technologies (Le et al. 2020). Previous studies showed that perceived control is a predictor of perceived usefulness (PU) and perceived ease of use (PEOU) (Spiekermann 2008), and perceived control influences PU and PEOU (Jing et al. Zhan 2020). Therefore, the following hypotheses are proposed:

H1: Perceived control will positively and significantly affect XR technology’s perceived ease of use for disabled tourists.

H2: Perceived control will positively and significantly affect XR technology’s perceived usefulness for disabled tourists.

2.2. Perceived Trust and XR technology's PEOU and PU

Previous studies have emphasized the role of perceived trust on intention to purchase (Aziz et al. 2019; Brewer and Kameswaran 2019). Trust is belief that expectations will be met without exploiting the vulnerabilities of the trustee (Aziz et al. 2019). Wade (2009) noted that the influence of tourism products usually depends on perceived trust by tourists. Gustavsson and Johansson (2006) stated that marketers must investigate new ways of using technology for people with disabilities because it influences their perceived trust. Scholars have found that trust is an external factor that drives people to accept automated vehicles through their PU and PEOU (Xu et al. 2018). Previous studies have also explored how perceived trust influences PU and PEOU and have added trust to TAM (Buckley et al. 2018; Panagiotopoulos and Dimitrakopoulos 2018). Consumer perceived trust directly affects PEOU and PU (Lai et al. 2013). Therefore, the following hypotheses are proposed:

H3: Perceived trust will positively and significantly affect XR technology's perceived ease of use for disabled tourists.

H4: Perceived trust will positively and significantly affect XR technology's perceived usefulness for disabled tourists.

2.3. Self-Efficacy and XR technology's PEOU and PU

Self-efficacy is a power that encourages easier acceptance of tourism-based technologies (Fatima Johra et al. 2017; Yoo et al. 2017). Technology self-efficacy refers to a person who evaluates his ability to use a technology (Venkatesh and Bala 2008). When disabled tourists realize that they do not need anyone's help in using XR technology and that they can use it, they likely will find the XR software and hardware user-friendly and useful, but if disabled tourists have weak technology self-efficacy, according to Meuter et al. (2005), they will suffer from "technology anxiety"; they no longer expect their needs to be met, and they will likely find the technology hard to use and of limited usefulness. In previous studies, technology self-efficacy among nondisabled tourists has been studied in detail, along with developing a technology acceptance model (Michopoulou 2013). In tourism studies, the impact of self-efficacy as an external factor on PEOU and PU (Fatima Johra et al. 2017; Tan et al. 2018) has been investigated and confirmed. Given the above, the following hypotheses can be proposed:

H5: Technology self-efficacy will positively and significantly affect XR technology's perceived ease of use for disabled tourists.

H6: Technology self-efficacy will positively and significantly affect XR technology's perceived usefulness for disabled tourists.

2.4. Perceived Enjoyment and XR technology's PEOU and PU

Perceived enjoyment of technology means how much a system leads to both performance and enjoyment (Balog and Pribeanu 2010). It is also defined as "the extent to which customers believe that taking part in the activity of experiencing destinations through VR would be enjoyable" (Vishwakarma et al. 2020, p. 46) and/or "the degree to which the user perceives the use of a VR device to be enjoyable" (Lee et al. 2019, p. 39). Because perceived enjoyment of technology is a qualitative factor (Liu and Park 2015) and an emotional response (So et al. 2020), it influences the experience of tourists and is an important motivating force for tourists to engage in virtual technology (Oakley 2019). Previous studies have investigated the relationship between perceived enjoyment and the adoption of some technologies (Al-Emran et al. 2022). For example, Y.-C. Huang, Backman, Backman and Moore (2013) found that user perceived enjoyment of XR technologies, like a 3D virtual tourism site, led to understanding the usefulness of this type of technology for planning travel. This has been confirmed in a study on the use of mobile applications for tourists (Briliana and Prasetyo 2018); moreover, Joe et al. (2020), in their study of acceptance of kiosks in hotels, found that customer perceived enjoyment positively affects perceived usefulness. In a study of visitors' acceptance of mixed reality in museums, Hammady et al. (2019a) found perceived enjoyment influences perceived ease of technology use and usefulness to visitors. Also, (Lee et al. 2019), in a study of tourist acceptance of XR technologies, reported perceived enjoyment

as one of the most important factors affecting perceived ease of technology use and usefulness. Vishwakarma et al. (2020) found that perceived enjoyment in using VR to experience a destination positively affects the perceived usefulness of VR. Based on previous studies, perceived enjoyment may affect how well disabled tourists accept XR technology. Therefore, the following hypotheses are proposed:

H7: Perceived enjoyment will positively and significantly affect XR technology's perceived ease of use for disabled tourists.

H8: Perceived enjoyment will positively and significantly affect XR technology's perceived usefulness for disabled tourists.

2.5. XR technology's PEOU and PU and Disabled Tourist Attitudes, and Behavioral Intentions

No research has been found that investigated the effects of PEOU and PU on disabled tourist attitudes. However, perceived usefulness and perceived ease of use are significant factors for non-disabled tourist attitudes toward XR technology acceptance (Kalantari and Rauschnabel 2018). Previous studies have tried to explain what influences user attitudes toward adopting mobile AR in tourism and underlined that PEOU (Paulo et al. 2018) and PU (D. tom Dieck et al. 2018) greatly affect XR technology acceptance. Chung et al. (2015) also conceptualized crucial factors of AR acceptance and concluded that PEOU and PU are crucial factors to visitor attitudes toward AR at a heritage site. Therefore, the following hypotheses are proposed:

H9: Perceived ease of use of XR technology will positively and significantly affect disabled tourist attitudes.

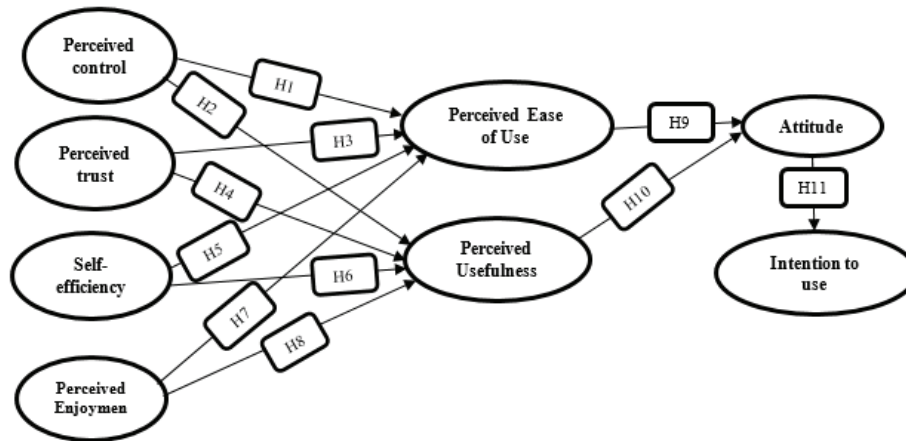
H10: Perceived usefulness of XR technology will positively and significantly affect disabled tourist attitudes.

Paulo et al. (2018) proposed a technology acceptance model that shows tourist attitudes affect behavioral intentions to use mobile AR in tourism as well as actual usage behavior. (Chung, Lee, Kim and Koo 2018) also noted that tourist attitudes toward XR technology affect the intention to visit tourism sites and use these technologies. The following hypothesis is thus proposed:

H11: Disabled tourist attitudes toward XR technology will positively and significantly affect the intention to use technology.

Accordingly, the current theoretical framework (Figure 1) has been presented to conceptualize the research hypotheses.

Figure 1: XR-TAM for Physical Disabled Tourists



3. METHODOLOGY

3.1. Measures

This study adopted all measures from previous literature (Table 1). Four items regarding perceived control were adopted from Le et al. (2022). Five items of perceived trust were selected from Almarashdeh (2019). Three items of self-efficacy, four items of attitude to XR technologies, and four items of intention to use the XR technology were inspired by Fatima Johra et al. 2017. Also, perceived enjoyment with four items and perceived usefulness with three items were measured by Vishwakarma et al. (2020). Four items of perceived ease of use were adopted from Sagnier et al. (2020). As the first step, people with disabilities were asked to watch two short videos to understand the application of these technologies in museums. The first one provides a short description of Virtual and augmented reality at Casanova Museum & Experience. The second one presents Augmented Reality for Museums and Art Exhibitions. Then they were guided to the questionnaire. The research questionnaire consisted of two parts. The first part covered demographic characteristics, and the second section held items for measuring research variables measured on a five-point Likert scale anchored at “1” = strongly disagree, and “5” = strongly agree. The survey was conducted from October 2020 to March 2021 in Tehran, Iran and in the Persian language. To determine the validity of the measurement tool, face validity and construct validity were used. To check face validity, the research questionnaire was sent to 3 tourism professors.

3.2. Data Collection

The population of this study were physically disabled Iranians. Because of the COVID-19 pandemic, online distribution and sampling strategy was used. The online questionnaire was sent through the state welfare organization of Iran. 640 people responded to the questionnaire. The demographic characteristics showed that 71% of respondents were male. In comparison, 29% of respondents were female, 12% were between the age group

of 20–26 years old, 10% between 27-33, 29% between 34-40, 16% between 41-47, 22% between 48-54, and 11% were over 55 years old. 69% of respondents were single and 31% were married. 52% of participants had high school education, 39% had a bachelor's degree, and 9% had a master's degree or a higher qualification.

4. DATA ANALYSIS AND RESULTS

4.1. Measurement Model Assessment

SmartPLS 3.0 was used as a statistical tool to conduct Partial Least Square (PLS) based SEM to test the framework and hypotheses (Ali et al. 2018). Skewness and Kurtosis criteria were used to evaluate the normality of data distribution. Furthermore, the measurement model for convergent validity was evaluated through loadings, VIF, AVE, CR, CA and Rho-A. As can be seen in Table 1, all the loadings exceed 0.6, which is the recommended value. The values of CR, CA, are greater than their recommended values of 0.7, and the values of AVE also exceed the value of 0.5 (Hair Jr et al. 2021). Also, the value of VIF (variance inflation factor) was found to be less than 5 for all observable items, and according to Henseler et al. (2009), these values are acceptable. In addition, the rho-A composite reliability coefficient was measured and for all variables, it was greater than 0.7, which according to Jöreskog, (1971) is an acceptable value and indicates that all variables have internal reliability.

Also, in order to the discriminant validity, Fornell-Locker index and HTMT were used (Table 2). Analysis of the Fornell-Locker index showed that the average square root of the extracted variance (AVE square root) of all variables is greater than the maximum correlation of the variables together. Hence, according to Fornell and Larcker, (1981), the model has discriminant validity at the construct level. Also, HTMT analysis showed that the value of this index for each pair of variables is less than 0.9 and according to Henseler et al. (2015), the model has discriminant validity at the construct level.

Table 1: Measurement model assessment

Construct	Items	Factor Loadings	VIF ¹	AVE ²	CR ³	CA ⁴	Rho-A
Perceived Control (PC)	The XR technology would let me visit the museum.	0.653	1.478	0.500	0.785	0.783	0.744
	Using the XR technology while visiting the museum would let me be decisive.	0.800	1.951				
	I would feel in control with the XR technology during my visit to the museum.	0.691	1.358				
	Using the XR technology aspects of the museum visit would give me more control over the visit process.	0.620	1.407				
Perceived Trust (PT)	I trust XR technology to provide a tool which is appropriate for conducting museum visiting.	0.724	2.321	0.553	0.861	0.858	0.904
	I expect that the quality of XR technology services will be good in visiting museums.	0.816	3.257				
	I trust XR technology to provide a secure visit to the museum	0.773	1.998				
	I trust the XR technology to provide better museum services.	0.760	1.870				
	I trust in the ability of XR technology to protect my privacy.	0.653	1.487				
Self-Efficacy (SE)	I am confident in using XR technology.	0.835	2.220	0.669	0.858	0.854	0.899
	I feel confident in using XR technology.	0.769	1.923				
	I am confident to describe different XR technologies to others.	0.861	2.347				
Perceived Enjoyment (PE)	Using XR technology for the museum visit is enjoyable.	0.670	1.588	0.531	0.819	0.816	0.781
	Using XR technology for the museum visit is fun.	0.794	1.925				
	The use of XR technology in experiencing visit the museum gives a lot of enjoyment.	0.715	1.726				
	Using XR in experiencing visit the museum bores me. (Reverse coded)	0.743	1.586				

¹ Variance Inflation Factor

² Average Variance Extracted

³ Composite reliability

⁴ Cronbach's alpha

Per-ceived ease of use (PEOU)	Learning to use XR technology would be easy for me.	0.798	1.783	0.590	0.850	0.844	0.856
	My interaction with XR technology is clear and understandable.	0.870	2.652				
	It would be easy for me to become skillful at using XR technology.	0.616	1.657				
	I find XR technology easy to use.	0.782	2.692				
Per-ceived use-fulness (PU)	Use of XR technology will help me to choose a museum in a better and comfortable way.	0.755	1.711	0.636	0.840	0.837	0.828
	Use of XR technology in planning museum visit is useful for me.	0.857	2.403				
	Using XR technology will help me to select a museum visit plan conveniently.	0.790	1.918				
Attitude to XR technology (ATT)	I think XR technology to visit the museum is a good idea.	0.742	1.595	0.581	0.845	0.843	0.824
	My attitude towards XR technology is positive.	0.896	1.827				
	It will be a pleasure for me to visit the museum via XR technology.	0.601	1.545				
	Visiting the museum via XR technology is desirable to me.	0.795	1.657				
Intention to use of XR technology (ITU)	I intend to use XR technology in future.	0.729	1.775	0.564	0.866	0.864	0.824
	I predict I will use XR technology for visiting the museum.	0.790	1.799				
	I plan on visiting the museum using XR technology.	0.704	1.585				
	I like to see myself using XR technology.	0.792	1.763				
	I will recommend others visiting the museum via XR technology.	0.757	1.577				

Table 2: The discriminant Validity

Fornell-Larcker								
	PC	PT	SE	PE	PEOU	PU	AXT	IUXT
PC	0.734							
PT	0.276	0.789						
SE	-0.251	-0.418	0.878					
PE	0.428	0.287	-0.077	0.771				
PEOU	0.424	0.173	-0.185	0.340	0.829			
PU	0.473	0.476	-0.247	0.397	0.197	0.860		
AXRT	0.238	0.286	-0.074	0.394	0.367	0.282	0.794	
IUXRT	0.407	0.462	-0.298	0.232	0.435	0.422	0.325	0.756
Heterotrait-Monotrait ratio (HTMT)								
PC								
PT	0.391							
SE	0.321	0.484						
PE	0.553	0.367	0.142					
PEOU	0.545	0.214	0.208	0.412				
PU	0.603	0.535	0.281	0.500	0.233			
AXRT	0.323	0.352	0.100	0.513	0.427	0.350		
IUXRT	0.509	0.558	0.342	0.285	0.523	0.492	0.385	

4.2. Structural Model Assessment

The hypothetical relationships were also assessed using Smart PLS 3.0. Table 3 shows the results of direct effects. The results of the model fit analysis showed that the model has a good fit. The value of SRMR was equal to 0.08, which is acceptable according to the scholars (Hu and Bentler 1999; Kline 2011). In addition, the ovalue of the GOF index was equal to 0.385, which, according to Wetzels et al. (2009), shows a strong structural fit and measurement of the model.

The results show that perceived control had a positive and significant effect on PEOU ($\beta = 0.19$, $t = 3.64$, $p < 0.05$) and perceived trust positively and significantly affected PEOU ($\beta = 0.16$, $t = 3.63$, $p < 0.05$). So, H1 and H3 were confirmed. However, H5 was rejected as self-efficacy had a negative effect on PEOU ($\beta = -0.04$, $t = -0.98$, $p < 0.05$). Perceived enjoyment was statistically significant and positive in its effect on PEOU ($\beta = 0.47$, $t = 9.60$, $p < 0.05$) and perceived control had a positive and significant effect on PU ($\beta = 0.21$, $t = 4.02$, $p < 0.05$), showing H7 and H2 were also supported. Furthermore, perceived trust was found to have a positive and significant effect on PU ($\beta = 0.45$, $t = 9.30$, $p < 0.05$), and self-efficacy had a positive and significant effect on PU ($\beta = 0.08$, $t = 1.98$, $p < 0.05$). Thus, H4 and H6 were confirmed. Perceived enjoyment also had a

positive and significant effect on PU ($\beta = 0.16$, $t = 3.44$, $p < 0.05$) and PEOU positively and significantly affected the attitude toward XR technology ($\beta = 0.32$, $t = 6.79$, $p < 0.05$), confirming H8 and H9. Finally, PU was found to have a positive and significant effect on attitude toward XR technology ($\beta = 0.26$, $t = 5.39$, $p < 0.05$), and attitude toward XR technology had a positive and significant effect on intention to use XR technology ($\beta = 0.42$, $t = 8.73$, $p < 0.05$). Thus, H10 and H11 were also supported.

Table 3: Structural model results

Hypothesized Paths		Standardized factor loading	T-value	R ²	Result
H ₁	PC → PEOU	0.19	3.64	0.44	accepted
H ₃	PT → PEOU	0.16	3.63		accepted
H ₅	SE → PEOU	- 0.04	- 0.98		rejected
H ₇	PE → PEOU	0.47	9.60		accepted
H ₂	PC → PU	0.21	4.02	0.43	accepted
H ₄	PT → PU	0.45	9.30		accepted
H ₆	SE → PU	0.08	1.98		accepted
H ₈	PE → PU	0.16	3.44		accepted
H ₉	PEOU → ATT	0.32	6.79	0.14	accepted
H ₁₀	PU → ATT	0.26	5.39		accepted
H ₁₁	ATT → ITU	0.42	8.73	0.02	accepted

Eleven hypotheses (see Table 4) were developed and tested. Perceived Control affected PEOU for XR technology among disabled tourists, so H1 was confirmed. Increasing Perceived Control by 1 unit increased by 4% the effect of PEOU variable on XR technology. H2, that perceived control affected PU of XR technology for disabled tourists, was also confirmed. That is, by increasing perceived control by 1 unit, the variable PU of XR technology increased by 0.044. The impact of H3, perceived trust affects PEOU of XR technology for disabled tourists, was also confirmed; increasing perceived trust by 1 unit of, increased the variable PEOU of XR technology by 2%. The perceived trust positively affected the PU, so H4 was also confirmed. The only hypothesis rejected in this study was H5, which posited that self-efficacy affected XR technology's PEOU for disabled tourists. The survey results showed that, unlike previous studies, self-efficacy does not influence PU for disabled tourists. H6, self-efficacy's influence on the PU of XR technology for disabled tourists was confirmed. Hypothesis 7, the positive relationship between perceived enjoyment and PEOU of XR technology, was also confirmed. The effect of perceived enjoyment on the XR technology's PU (H8) was also approved. H9, the PEOU of XR technology having an effect on disabled tourist attitudes, was also confirmed. Increasing 1-unit PEOU of XR technology improves disabled tourist attitudes by 10%. Furthermore, PU's effect on disabled tourist attitudes toward XR technology (H10), was confirmed, increasing PU of XR technology by 1-unit improved attitudes toward XR technology by 7%. Finally, the influence of disabled tourist attitudes toward XR technology on intention to use (H11) was confirmed as well. Increasing disabled tourist attitudes toward XR technology by 1-unit increased intention to use by 18%.

5. DISCUSSION AND IMPLICATION

This research aimed to identify the factors influencing disabled tourist acceptance of XR technology. To do so, a conceptual model was developed based on the literature review and was tested. This result of this research revealed that Perceived Control affected PEOU for XR technology among disabled tourists and this is in line with previous research (Jing et al. 2020; Le et al. 2022). This confirms perceived control as the fundamental predictor of activities of disabled people. The positive impact of perceived control on PU of XR technology for disabled tourists was also consistent with the literature (Jing et al. 2020; Le et al. 2022). This confirmed that perceived control is a fundamental predictor of PU for the disabled.

The confirmation of perceived trust affecting both PEOU of XR technology for disabled tourists reaffirms other studies (Buckley et al. 2018; Panagiotopoulos and Dimitrakopoulos 2018; Xu et al. 2018), showed that trust affects all tourist PEOU. Previous studies have also revealed the positive effect of perceived trust on XR technology's PU (Buckley et al. 2018; Panagiotopoulos and Dimitrakopoulos 2018; Xu et al. 2018), a result confirmed in this research

Although some evidence supports self-efficacy as a strong determinant of PEOU (Fatima Johra et al. 2017; Tan et al. 2018), this research found the reverse for disabled tourists. This could be because of unfamiliarity with XR technologies or having little experience with technology. Self-efficacy is conceptualized as a variable that represents the belief that one can perform a specific task, in this case, using a technology. Previous studies have stated that the absence of experience with technology affects confidence in one's ability to use technology, which affects judgments about how easy a new system will be to use (Venkatesh 2000). Furthermore, technology anxiety is a factor affecting self-efficacy as it relates to user perceptions about computer use. Although self-efficacy relates to judgments about ability, technology anxiety is a negative affective reaction toward technology use. A huge body of research in IS and psychology has stressed the significance of technology anxiety by showing its impact on main dependent variables (Parasuraman and Igarria 1990). Accordingly, technology experience and anxiety could explain why Hypothesis 5 was rejected.

However, self-efficacy's influence on the PU of XR technology for disabled tourists was in line with previous studies (Tan et al. 2018). This result was the same for the perceived enjoyment's effect on PEOU which confirmed the results related to past studies (Hammady et al. 2019a; Lee et al. 2019). This confirms that the more enjoyable disabled tourists find technology, the easier it is to use.

The effect of perceived enjoyment on the XR technology's PU was also confirmed as in past studies (Briliana and Prasetio 2018; Joe et al. 2020; Lee et al. 2019; Pishchenko and Myriounis 2016; Vishwakarma et al. 2020). Furthermore, the PEOU of XR technology had a positive effect on disabled tourist attitudes and this also agrees with previous research (Chung et al. 2015; Paulo et al. 2018). PU's effect on disabled tourist attitudes toward XR technology was also supported by previous research (Chung et al. 2015; tom Dieck et al. 2018). Generally, the most significant impact on disabled tourist attitudes toward XR technologies was related to PEOU, while the least impact came from PU.

Finally, the influence of disabled tourist attitudes toward XR technology on intention to use was also in line with previous research (Chung et al. 2018; Paulo et al. 2018).

Overall, several fundamental findings emerged from this research. The model was significantly supported by the findings on the determinant's attitudes of the disabled toward XR technology. Other than the effect of perceived efficiency on PEOU, all the hypotheses were supported, demonstrating the positive effects of each of factors on the attitudes of disabled tourists and their behavioral intentions towards XR technology. The study of the relationships and effects revealed in the results shows that for PEOU, perceived enjoyment had the highest impact on XR technology use, with perceived control second and perceived trust and self-efficacy with the lowest impact among disabled tourists. In addition, the main result was that the effect of all these variables on PEOU for disabled tourists is stronger than the individual effect of each variable. This means that the variables of perceived enjoyment, perceived control, and perceived trust have a synergic effect; that is, together and in combination, they have a huge impact on disabled tourists. In fact, XR technology's PEOU among disabled tourists is influenced by the overall effects of these variables; the PU of XR technology for disabled tourists is influenced by all these variables, individually and in combination.

Several theoretical contributions have been made in XR technology, tourism and disabled tourists' behaviour context as a result of the findings of this study. Firstly, this study expands the existing literature on behavioural intention theory to develop a theoretical and conceptual model for understanding how disabled tourists' behavioural intentions will be influenced to use these kinds of technologies. Secondly, to the best of knowledge, the determining criteria to predict disabled tourists' behaviour toward XR technology in museums has never been explored before. The framework developed in this study can provide critical insights to other academic scholars interested in examining the behavioural intentions of disabled tourists towards XR technologies. In addition to provide new information on XR technology acceptance in a country where little research has been carried out, this research presents new academic knowledge about this area.

Thus, this study significantly expands our knowledge about which factors should be the focus for these markets. The relationships between constructs have emerged from previous studies but were not empirically tested for disabled tourists. So, to the best of our knowledge, this study is a pioneer to investigate these factors in relation to the disabled. In this research, we went beyond what influences non-disabled tourists to use XR technology and explored the intentions and attitudes of the disabled toward XR technologies in tourism.

This study also has implications for marketers and managers. The fundamental factors influencing disabled tourists to adopt XR technologies in museums were uncovered; museums should adopt such technologies as VR, AR, and 360-degree videos to transform their facilities and allow disabled individuals to have a better experience (The Council for Museums, archives and 2001) (The Council for Museums, archives and Libraries 2001). Experience with technology and expanding knowledge of XR technologies not only improves understanding of how these technologies can be used by the disabled, but also increases accessible tourism. This will vastly help heritage tourism market adding the factors valued by disabled tourists to increase their motivation visiting museums.

6. LIMITATION AND FUTURE RESEARCH

The limitations of this study provide avenues for future research. To permit better generalization of the results, the proposed model should be tested in other tourism contexts and other locations. Comparing these findings from Iran with other developed countries may provide interesting contrasts. The factors and scales for this study were selectively chosen from available literature and then quantitatively tested; however, future studies can perform qualitative studies to explore new concepts and variables related to this context. Despite the potential of XR technologies to enhance disabled tourist experiences in tourism, researchers have not studied this context using interviews. This study provides a first exploration of the impact this technology can have on the behavior of tourists with physical disabilities. Future studies can consider other factors like emotions (e.g., pleasure, arousal, dominance), positive/negative affect, enjoyment, hedonic value/consumption, and memorable experiences in TAM or other theories. Furthermore, using technology can greatly help disabled tourists perform activities at a destination, so testing the factors explored here in other tourism contexts would be worth investigating. This study focused on physically disabled tourists, but future studies could investigate using XR technologies in accommodating other disabilities (Sheehy et al. 2019). With 15% of the world's population disabled, understanding their consumer behavior should be a concern in future studies.

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