STUDIA UBB GEOGRAPHIA, LXVIII, 2, 2023 (p. 95-138)
(RECOMMENDED CITATION)
DOI:10.24193/subbgeogr.2023.2.06

VIRTUAL REALITY IN DESTINATION MARKETING: THE WHY, THE WHO AND THE WHEN

Sergiu Grigore PRODAN[1], István EGRESI[2]

ABSTRACT. Virtual Reality in Destination Marketing: The Why, The Who and The When. Virtual reality (VR) is one of the fastest growing areas in information and communication technologies. Starting with the 1990s, the technology has also been successfully employed in tourism. Among other purposes, VR is used in tourism to provide a more effective marketing of a destination than classical means such as (paper) brochures. While the literature on the use of VR in destination marketing has been steadily growing, it is still scarce and fragmented. The main objective of this study is to better understand how could VR be used to improve the marketing of tourism destinations. To gather data for this study an experiment was used: participants were invited to take an online virtual tour of a very popular landmark in Paris, and then fill out a questionnaire in order to share their experience. The data from the 89 questionnaires collected were then processed using SPSS. The results have shown that almost all of our respondents were satisfied with their VR experience. Moreover, the VR experiment has improved the users' image of and satisfaction with the destination. This, in turn, has positively influenced their intention to visit or re-visit the destination and to recommend it to others. The study also found that some socio-demographic groups (female, older than 25 years) may be more suitable targets for destination marketing using VR than others. Finally, we learned that, although the use of VR is effective for destination marketing both before and after tourists visit the site, the technology may be more useful in improving the image of the destination when applied before the physical visit.

Keywords: *virtual reality, virtual tourism, destination marketing, destination image, user satisfaction.*

[1] *Babeş-Bolyai University, Faculty of Geography, 5-7 Clinicilor Street, Cluj-Napoca, Romania, e-mail: sergiu.grigore.prodan@stud.ubbcluj.ro*

[2] *Babeş-Bolyai University, Faculty of Geography, Center for Research on Settlements and Urbanism, 5-7 Clinicilor Street, Cluj-Napoca, Romania, e-mail: istvan.egresi@ubbcluj.ro*

Introduction

Virtual reality (VR) is one of the fastest growing areas in information and communication technologies (ICT). The technology dates back to the 1960s and since then it has been adopted by many industries (Berg & Vance, 2017), including tourism, in the 1990s (Williams & Hobson, 1995). During the COVID-19 pandemic, the VR technology was especially useful because it allowed a user to experience a destination without physically traveling there (Wei, 2019). However, application of VR in tourism did not stop when the COVID-19 pandemic ended. On the contrary, many scholars agree that VR is set to become even more prevalent in tourism in the following years (Guttentag, 2010; Tussyadiah et al., 2018; Mura, Tavakoli, and Sharif, 2017; Jayawardena, 2019) to the point that it may determine future trends in tourism development (Yung & Khoo-Lattimore, 2019; Mohanty, Hassan, and Ekis, 2020; Huang et al., 2016).

So far, the technology has been applied especially by museums (Thomas & Carey, 2005; Navarrette, 2019; Han, tom Dieck, and Jung, 2018; He, Wu, and Li, 2018), heritage sites (Marasco et al., 2018) and theme parks (Wan et al., 2007), areas in which a number of scholarly studies have demonstrated that the use of VR technology could encourage physical visitation (Thomas & Carey, 2005; Guttentag, 2010; Dewailly, 1999).

Impressed by the tremendous growth of ICT applications in tourism, some researchers even stated that virtual tourism has the potential for replacing traditional tourism (Martins et al., 2017). While we and others (Sussman & Vanhegan, 2000) do not share this sentiment, it is clear that virtual tourism could be a sustainable alternative to physical travel especially in areas that enjoy some form of protection, such as heritage sites and sensitive natural areas where it is necessary to limit the number of visitors (Tussyadiah et al., 2018), in places that are dangerous to visit and/or inaccessible (Verma et al., 2022) or in situations when certain population segments are limited in their movement by age, disability or financial problems (Guttentag, 2010; Lu et al., 2022).

VR applications have the ability to change the way tourists experience destinations (Verma et al., 2022; Lin et al., 2020). In this sense, the biggest strength of this technology is that it allows potential tourists to visualize the spatial environment of their target destination which could provide them with rich information in the planning stage (Berger et al., 2007; Guttentag, 2010). For example, a study financed by Priceline in 2016 has found out that "almost half of Millennials would use a VR headset to preview a destination they are planning to travel to" (quoted in Gibson & O'Rawe, 2017). In so doing, VR could also serve an educational purpose (Griffin & Muldoon, 2022; Zarzuela et al., 2013; Han et al., 2018), thus enhancing the destination visitation experience of tourists

(Moorhouse, tom Dieck, and Jung, 2018). However, not all scholars agree with this view. For example, Cabello et al. (2011, p. 1) noted that "using virtual world technologies as a new means of information for potential tourists is a big challenge where the methods, goals and needs still need to be exactly identified".

From the industry and destination management perspective, VR has been used in six main areas (Guttentag, 2010): planning (Wei, 2019), destination management and marketing (Williams & Hobson,1995; Guttentag, 2010; Huang et al., 2016; Moorhouse, tom Dieck, and Jung, 2018; Griffin et al., 2017, Lu et al., 2022; Subawa et al., 2021; Akhtar et al., 2021; Vishwakarma, Mukherjee, & Datta, 2020), heritage preservation (Dewailly, 1999; Marasco et al., 2018), entertainment (Wan et al., 2007), accessibility and education (Griffin & Muldoon, 2022; Zarzuela et al., 2013; Han, tom Dieck, and Jung, 2018).

Of these, the most popular area among researchers has been marketing (e.g., Guttentag, 2010; Huang, Backman, Backman, & Moore, 2013; Tussyadiah et al., 2018; Yung & Khoo-Lattimore, 2019). A review study by Yung & Khoo-Lattimore (2019) established that 28.28% of all scientific studies on the application of VR in tourism have been published in this area. Using VR as a marketing tool for destinations makes sense because, unlike in other industries, in tourism, one cannot test the product before buying it (Roughhead, 2017; Flavian, Ibanez-Sanchez, & Orus, 2021; Israel, Zerres, & Tscheulin, 2019). VR technology provides potential tourists with rich data in 3D form about the destination advertised thus reducing the perceived risks and allowing the customer to make an informed decision (Cheong, 1995). Moreover, besides offering potential tourists a virtual image and more contextual information about the destination, VR technologies also promise users an immersive, interactive, vivid and enjoyable experience (Fan, Jiang, and Deng, 2022).

A number of studies have already demonstrated that VR could provide a more effective marketing of a destination than classical means such as (paper) brochures (Wan et al., 2007). Consequently, a growing number of hotels, restaurants, travel agencies and tourism destinations started including virtual tours as part of their marketing strategies (Guerra, Pinto, and Beato, 2015). However, a marketing strategy using VR is not without risks and challenges. For example, a study by Tussyadiah et al. (2018) questions the effectiveness of using VR in destination marketing. Similarly, Abrash (2016) has shown that, in spite of increased use of VR in destination marketing, the strategy had very little impact on potential tourists' decision making. Moorhouse, tom Dieck, and Jung (2018) explained that this may be because tourism marketers lack the knowledge on how to apply the VR technology in order to influence users' travel decisions. Other reasons why the technology is not yet used extensively in tourism marketing are related to high costs involved as the technology is still

expensive and to the fact that users need to be technology savvy (Han, tom Dieck, and Jung, 2018; Mascho & Singh, 2013). Some destination managers and marketers also worry that the use of VR technologies may have unintended consequences; for example, in the case of heritage sites, managers fear that the use of VR could dilute the authenticity of the site (Dueholm & Smed, 2014).

Even though the literature on the use of VR in tourism marketing has been steadily growing (Han, tom Dieck, and Jung, 2018), it is still scarce and fragmented (Moorhouse, tom Dieck, and Jung, 2018; Verma et al., 2022). A number of more recent studies have investigated how virtual tours can change tourists' attitudes towards a destination and influence their visitation intention (Kim et al., 2020). However, most of these studies are very general and, while they agree that employing virtual tours (VT) may be useful for destination marketing, they rarely make any useful recommendations to tourism practitioners. The main objective of this study is to better understand how could VR be used to improve the marketing of a tourism destination. It will try to answer the following questions:

1. How satisfied were users of the VR technology with their experience?
2. Can VT improve the image of a destination?
3. Can VR technology influence users' satisfaction with visiting a destination?
4. Can this technology influence users' intention to visit or re-visit a destination and/or recommend it to others?
5. Which socio-demographic segments are the most likely to enjoy the VR, to improve their image of the destination and to decide to visit (or re-visit) the destination after the VR experiment?
6. Is it better to use VR for marketing purposes before or after the actual physical visit to the destination?

The paper will proceed as follows: after a thorough review of the extant studies, we will discuss our methodology to collect and process the data and, then, we will present our findings. In the last section, we will summarize the main findings emphasizing its practical implications and acknowledging its limitations.

Literature Review

Virtual tourism (VT) and virtual reality (VR)

Our intention here is limited to identifying and to shortly defining the main concepts related to our research topic without getting too specific. Scholars interested in learning more about VT and VR should consult the

handful of papers that review the extant literature on the subject (Moro et al., 2019; Yung & Khoo-Lattimore, 2017; Fan, Jiang, and Deng, 2022; Beck, Rainoldi, & Egger, 2019; Flavian, Ibanez-Sanchez, and Orus, 2019; Guttentag, 2010; Loureiro, Guerreiro, and Ali, 2020).

VT is a concept that refers to the situation in which someone is able to experience a specific place without actually (physically) traveling to the location (Verma et al., 2022; Loureiro, Guerreiro, and Ali, 2020; Cho, Wang, and Fesenmaier et al., 2002; Daasi & Debbabi, 2021). This can happen via "the use of computer-generated 3D environment – called a 'virtual environment' (VE) – that one can navigate and possibly interact with, resulting in real-time simulation of one or more of the user's five senses" (Guttentag, 2010, p. 638). VE used in tourism applications generally replicate central areas of tourist cities with a great number of tourism attractions that can be examined using a VR tool in greater detail (Guttentag, 2010).

The technology that allows the users to partially or fully immerse themselves into the VE (Gonzalez, Richards, and Bilgin, 2021) and to sense that they are physically and psychologically present in that very place (Guttiérez, Vexo, & Thalmann, 2008; Tussyadiah et al., 2018; Loureiro, Guerreiro, and Ali, 2020; Lu & Hsiao, 2022; Marasco et al., 2018) is known as VR. The level of immersion could vary (Baños et al., 2004)) with a fully immersive state referring to a complete disconnect from the real place "in which the participant's body is actually located" (Sanchez-Vives & Slater, 2005: 333). While immersed into the VE, the user also has the ability to "navigate" and "interact with" the VE (Wiltshier and Clarke 2017). The mental imagery could be so strong that the participant may no longer distinguish between real and illusion (Wedel, Bigné, and Zhang, 2020; He, Wu, and Li, 2018; Fan, Jiang, and Deng, 2022). Thus, the three key elements that characterize any effective VR are visualization, immersion and interactivity (Yung & Khoo-Lattimore, 2019).

Another important concept linked to VT and VR is presence or telepresence. The concept of presence refers to the "psychological similarities between virtual and actual objects when people experience – perceive, manipulate, or interact with – virtual objects" (Lee, 2004: p. 38). To put it more simply, presence measures how realistic the destination is portrayed by the VE (Slater & Usoh, 1993). VR induces mental imagery for real-world like tourism experiences (He, Wu, Li, 2018) so when the VE is a true representation of the destination, it could have a positive influence on the user's intention to physically visit the destination (Tussyadiah et al., 2018; Marasco et al., 2018; Kim & Hall, 2019; Lee et al., 2010). Indeed, Tussyadiah et al. (2018) conducted two studies in Hong Kong and UK on the use of VR technology in destination marketing. They found that users are likely to enjoy the VR experience when this technology

allows them to be "transported" in the VE. When participants feel that they are physically and psychologically present in the VE they will end up liking the destination more which will determine a higher level of visitation intention.

User satisfaction and intention to visit

This concept can be broken up into three components: satisfaction with the VR experience, satisfaction with the destination and intention to visit. However, as any literature review will show, the three components are connected. Users are more likely to physically visit the destination when they are satisfied with their VT experience (Kim, Lehto, and Kandampully, 2019; Nguyen, Le, and Chau, 2023) and when the VR improves their image of the destination (Huang & Hsu, 2009). Also, a positive experience with the VR tour could lead to increased positive feelings toward the destination (Huang et al., 2016), which, in turn, could influence users' intention to physically visit the destination. Before taking the VR tour, most users have an image of the destination that was made up by previous experiences, other people's experiences, media advertising and common beliefs (Baloglu and Brinberg 1997, as cited in Buhalis 2000). However, this initial image can be changed following the VR tour.

Indeed, as several studies have highlighted, VR can play an important role in destination image building (Govers, Go, and Kumar, 2007; Hyun O'Keefe, 2012). By creating imagery and information that is realistic (Gibson & O'Rawe, 2018; Guttentag, 2010), the VR tour allows the user to make an informed decision about travel to the destination (Sussman & Vanhegan, 2000) and even daydream about the destination (Bogicevic et al 2019) which, then, could translate into the actual visitation of the destination (Hyun and O'Keeffe, 2012) and a greater likelihood of sharing information about the destination with friends and family (Griffin et al., 2017). Indeed, a study by Griffin & Muldoon (2022) on a number of participants who were given a VR HMD tour of a slum in Manila has found that most participants have become more confident and more comfortable to physically visit the slum because they felt that the VR tour was a realistic representation of the slum. Similarly, a study by Marasco et al. (2018) has demonstrated that visual appeal of VR and emotional involvement can have a positive and significant effect on tourists' attitudes and behavior, which, then, can increase the likelihood of visitation.

The literature also shows that experiments with VR tours have already been included in destination marketing studies. For example, Gibson & O'Rawe (2018) used 360-degrees VR videos of the Wild Atlantic Way developed by Ireland's marketing and product development agency to learn about users' attitudes and experiences. The results indicated that a positive experience with the VR tour could increase the likelihood of physically visiting the destination

in the future. Other case studies with similar results were conducted in Scotland (Roughhead, 2017), British Columbia, Canada and Australia (Yung & Khoo-Lattimore (2017), as well as Valladolid in Spain (Zarzuela et al., 2013). After having toured the destination in VR, most participants are looking forward to physically travel to the site so that they can compare it to the one reconstructed in VR (Pantano & Servidio, 2011).

Differences between population groups' assessment of VR

We found that the literature is ambivalent about how certain demographic characteristics can influence users' satisfaction with the VR tour and their intention to visit de destination. Thus, while Tussyadiah et al. (2018) found that younger tourists are more likely to be interested in VR, Marasco & Balbi's (2019) and Akhtar et al.'s (2021) studies concluded that older tourists may be better targets for promoting a destination using VR. Others found no differences across demographic groups (Gibson & O'Rawe, 2018). Marasco & Balbi (2019) also found that women and lower educated tourists tended to be more appreciative of VR as a marketing instrument.

Differences between those who have already visited and those who have not visited the destination

VR tours can be given pre-, post-, or during physical trips to a destination (Nguyen et al., 2023). People perceive destination images differently, depending on whether they have been there in the past or they intend to visit in the near future (Hughes, 2008). A legitimate question here is when would it be more effective to give such VR tours from a marketing perspective? Does the timing of the VR tour moderate the perceived usefulness for influencing intention to visit, perceived ease of use or enjoyment of the VR experience? Kim & Hall (2019) argued that the answer is yes to all of these questions. VR users who have already visited the destination are able to associate the VE with the destination environment, thus, creating clear mental imagery; at the same time, those who have not yet visited the destination form a vaguer mental imagery following the use of the immersive technology (Fan, Jiang, and Deng, 2022). This is the reason why extant literature makes a clear distinction between real tourists (those who have visited the destination) and imaginary tourists (those have only visited the destination through VR). Visitors generally find it easier to immerse themselves into the VE while the imaginary visitors have more difficulty generating mental imagery (Bogicevic et al., 2019). Another study, by Fan, Jiang, and Deng (2022) found that prior visitation has a negative moderating effect of presence on the VR experience.

Methodology

Data collection

To gather data for this study we first employed an experiment (according to Akhtar et al. (2021), most VR-related studies are based on experimental research). Before filling out a questionnaire, the participants were asked to take a VR tour of the city of Paris lasting between 10 and 15 minutes. The invitation to participate was sent using a number of social media platforms (Facebook, Reddit, Messenger, WhatsApp, Instagram and Snapchat). Those who agreed to participate in our study were sent a link to a website (www.youvisit.com/tour/paris) and instructions on how to take one of the virtual tours featured on this website. Among the popular tourism objectives participants could choose to virtually visit, were: the Eiffel Tower, the Notre Dame Cathedral, Sainte-Chapelle, the Luxembourg Gardens and others.

After completing the VR tour, the participants were invited to fill out a questionnaire in which to share their first impression of the VR experiment. We have, in fact, prepared two sets of questionnaires: one for those who have visited the chosen tourism objective in the past and one for those who have not.

The questionnaire was divided into two parts. In the first part, we collected socio-demographic data about the participants: gender, age, level of education, income, and knowledge of technology. The second part included a number of 14 statements that were identical for both versions of the questionnaire plus seven and respectively five statements that were specific for each version. The statements referred to the respondents' satisfaction with the VR tour experience, their image of the destination after taking the tour and their intention to visit or re-visit. Respondents could express their agreement or disagreement with each statement using a Likert scale from 1 to 5, with 1 meaning total disagreement and 5 total agreement.

In the end, 89 usable questionnaires were collected, of which 30 were sent by participants who visited the objective in Paris before viewing the VR and 59 by users who have not yet been at the destination. In writing the questionnaire items we were inspired by similar studies (for example, Gibson & O'Rawe, 2018).

Data processing

We employed SPSS 26 to process the data resulting from the questionnaires collected. We used descriptive statistical methods (frequencies, percentage of total, median and IQR) to understand the socio-demographic make-up of our sample and to evaluate participants' answers to our statements

and inferential statistics (Mann-Whitney U Test and Kruskal-Wallis H Test) to learn whether or not there were any statistically significant differences between groups based on socio-demographic characteristics and visitation status (whether or not they have visited the site in the past).

Findings

Socio-demographic characteristics of our respondents

Most of our respondents were women, young (18-25 years), with less than a university degree and with average or above average incomes (table 1). Also, more than half did not see themselves as "technology-savvy". Lastly, one-third of our respondents has physically visited the site in the past and two-thirds have taken other virtual tours in the past (table 1).

Table 1. Socio-demographic characteristics of respondents

Socio-demographic characteristic	Frequency	% from total	Socio-demographic characteristic	Frequency	% from total
Gender			***Income***		
Male	27	30.34	Below average	37	41.57
Female	62	69.66	Average and above	52	58.43
Age group					
18-25 years	55	61.80	***Technical skills***	41	46,06
26+ years	34	38.20	***Have physically visited the site***	30	33,70
Education			***Have taken virtual tours in the past***	58	66,17
Less than university degree	57	64.05			
Undergraduate degree+	32	35.95			

Source: the authors

Satisfaction of participants who have physically visited the site in the past

Table 2 below shows that our respondents were generally satisfied with their VR experience (all medians were 4 or higher). They particularly found the VR tour to be very pleasant and very interesting (medians 4.5) and were willing to recommend it to others (median 5).

Table 2 also shows that our respondents were satisfied with the destination (medians 4 and up). They especially enjoyed revisiting the location they have physically visited in the past (median 5). Finally, the participants agree that the VR influenced their decision to revisit the destination in the near future and to recommend it to others (medians 4). They also assessed the use of VR technology to be very useful for destination marketing (median 5).

Table 2. Satisfaction of tourists who have physically visited the site in the past

Satisfaction with experience (n= 30)	**Totally disagree (%)**	**Disagree (%)**	**Not sure (%)**	**Agree (%)**	**Totally agree (%)**	**Median**	**IQR**
Information about the destination is accurate	0	6.7	13.3	36.7	43.3	4.00	1.00
Information about the destination is reliable	3.3	0	16.7	43.3	36.7	4.00	1.00
Information about the destination is well-organized	0	10.0	16.7	43.3	30.0	4.00	2.00
During the virtual tour I felt completely immersed	6.7	10	16.7	36.7	30.0	4.00	2.00
During the virtual tour I felt totally involved	0	6.7	26.7	26.7	40.0	4.00	2.00
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	6.8	3.3	23.3	23.3	43.3	4.00	2.00
The virtual tour was very pleasant	0	6.7	16.7	26.7	50.0	4.50	1.00
The virtual tour was very interesting	3.3	10.0	10.0	26.7	50.0	4.50	1.00
I learned a lot after this virtual tour	3.3	20.0	23.3	26.7	26.7	4.00	2.00
I am very satisfied with this virtual tour experience	3.3	10.0	20.0	36.7	30.0	4.00	2.00
I will go on other virtual tours in the future	3.3	6.7	26.7	23.3	40.0	4.00	2.00

Satisfaction with experience (n= 30)	**Totally disagree (%)**	**Disagree (%)**	**Not sure (%)**	**Agree (%)**	**Totally agree (%)**	**Median**	**IQR**
I will recommend the virtual tour to others	0	13.3	13.3	13.3	60.0	5.00	2.00
I enjoyed virtually revisiting the location I visited physically in the past.	0	3.3	23.3	13.3	60.0	5.00	2.00
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	0	3.3	16.7	36.7	43.3	4.00	1.00
The image of this tourism destination has improved after this virtual tour	6.7	13.3	26.7	23.3	30.0	4.00	2.00
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	6.7	16.7	20.0	33.3	23.3	4.00	2.00
During this virtual tour I was able to study the location in greater detail	16.7	3.3	20.0	26.7	33.3	4.00	2.00
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	10	6.7	26.7	13.3	43.3	4.00	2.00
This virtual tour influenced my decision to revisit this tourism destination	10	6.7	26.7	23.3	33.3	4.00	2.00
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	6.7	6.7	20.0	26.7	40.0	4.00	2.00
I think using VR technology is very useful to visit a tourist destination/ attraction	3.3	3.3	20.0	20.0	53.3	5.00	2.00

Source: the authors

We found no statistically significant differences in experience satisfaction based on gender (annex 1), level of education (annex 3), income (annex 4) and technical skills (annex 5). However, we found some statistically significant differences in experience satisfaction based on age (table 3; annex 2). It seems that participants 26 years of age or older are more likely to benefit from the VR tour than youger participants. For example, they tend to find the information acquired through VR to be more reliable and to learn during the VR tour. They are also more likely than younger users to discover new details about the destination and to have their image of the destination enhanced following the VR tour (table 3).

Table 3. Differences in experience satisfaction among those who already visited the destination based on age

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is reliable	18-25 yr.	22	13.14	U= 140.0 Z= 2.621	**.013***
	26+ yr.	8	22.00		
I learned a lot after this virtual tour	18-25 yr.	22	13.59	U= 130.0 Z= 2.029	**.049***
	26+ yr.	8	20.75		
The image of this tourism destination has improved after this virtual tour	18-25 yr.	22	13.11	U= 140.5 Z= 2.540	**0.12***
	26+ yr.	8	22.06		
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	18-25 yr.	22	13.61	U= 129.5 Z= 2.009	**.049***
	26+ yr.	8	20.69		
During this virtual tour I was able to study the location in greater detail	18-25 yr.	22	13.41	U= 134.0 Z= 2.234	**.031***
	26+ yr.	8	21.25		

* Significant at 95% confidence level

Source: the authors

Satisfaction of participants who have not yet physically visited the site

Table 4 shows that those participants who have not visited the site physically were also satisfied with their VR experience (medians 4 or higher). The highest median (5) was calculated for six statements. Thus, the majority of the participants totally agreed that the information about the destination is reliable, and that the VR tour was very pleasant and interesting. Most users also

totally agreed that they will take other VR tours in the future and will recommend them to others. Finally, most participants found the VR technology very useful for destination marketing (table 4).

Table 4. Satisfaction of participants who have not yet visited the site physically

Satisfaction with experience (n= 59)	Totally disagree (%)	Disagree (%)	Not sure (%)	Agree (%)	Totally agree (%)	Median	IQR
Information about the destination is accurate	3.4	5.1	6.8	39.0	45.8	4.00	1.00
Information about the destination is reliable	3.4	5.1	10.2	25.4	55.9	5.00	1.00
Information about the destination is well-organized	3.4	1.7	10.2	35.6	49.2	4.00	1.00
During the virtual tour I felt completely immersed	1.7	3.4	15.3	42.4	37.3	4.00	1.00
During the virtual tour I felt totally involved	3.4	1.7	15.3	40.7	39.0	4.00	1.00
During the virtual tour I felt that I was physically present at the tourism site	11.9	6.8	25.4	25.4	30.5	4.00	2.00
The virtual tour was very pleasant	1.7	1.7	11.9	33.9	50.8	5.00	1.00
The virtual tour was very interesting	1.7	1.7	11.9	28.8	55.9	5.00	1.00
I learned a lot after this virtual tour	3.4	8.5	13.6	35.6	39.0	4.00	2.00
I am very satisfied with this virtual tour experience	3.4	3.4	13.6	40.7	39.0	4.00	1.00
I will go on other virtual tours in the future	1.7	3.4	8.5	28.8	57.6	5.00	1.00
I will recommend the virtual tour to others	3.4	1.7	11.9	23.7	59.3	5.00	1.00
I enjoyed seeing virtually the location I planned to visit physically	6.8	1.7	18.6	25.4	47.5	4.00	2.00
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	3.4	5.1	13.6	39.0	39.0	4.00	1.00

Satisfaction with experience (n= 59)	Totally disagree (%)	Disagree (%)	Not sure (%)	Agree (%)	Totally agree (%)	Median	IQR
The image of the tourist destination has improved as a result of this virtual tour	3.4	0	25.4	22.0	49.2	4.00	2.00
During this virtual tour I was able to study the location in greater detail	5.1	3.4	25.4	32.2	33.9	4.00	2.00
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	1.7	1.7	25.4	33.9	37.3	4.00	2.00
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	5.1	5.1	18.6	23.7	47.5	4.00	2.00
I think using VR technology is very useful to visit a tourist destination/attraction	5.1	1.7	8.5	25.4	59.3	5.00	1.00

Source: the authors

We found that, in the case of those participants who have not yet visited the destination, presence is, in general, stronger for women than for men (table 5; annex 6). Thus, women are more likely than men to feel totally immersed and involved during the virtual tour as if they were physically present at the tourism site (table 5).

Table 5. Differences in experience satisfaction among those who have not yet visited the destination based on gender

Satisfaction with experience	Gender	N	Mean ranks	Test statistic (t)	p-value
During the virtual tour I felt completely immersed	Male	18	23.00	U= 495.0 Z= 2.225	**.026***
	Female	41	33.07		
During the virtual tour I felt totally involved	Male	18	23.47	U= 486.5 Z= 2.074	**.038***
	Female	41	32.87		
During the virtual tour I felt that I was physically present at the tourism site	Male	18	21.31	U= 525.5 Z= 2.661	**.008***
	Female	41	33.82		

* Significant at 95% confidence level

Source: the authors

In terms of age, we found a statistically significant difference in experience satisfaction for only two statements. Thus, participants 26 years of age or older are more likely than younger participants to enjoy touring the site virtually before the actual visit and to recommend the destination to others (table 6; annex 7).

Table 6. Differences in experience satisfaction among those who have not yet visited the destination based on age

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
I enjoyed seeing virtually the location I planned to visit physically	18-25 yr.	33	25.41	U= 580.5 Z= 2.480	**.013***
	26+ yr.	26	35.83		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	18-25 yr.	33	26.09	U= 558.0 Z= 2.108	**.035***
	26+ yr.	26	34.96		

* Significant at 95% confidence level

Source: the authors

With the exception of one statement we found no differences in the way participants of different education levels evaluate their satisfaction with the VR experience. The only exception is that participants with less than a college degree are more likely to go on other virtual tours in the future than participants that have at least a college degree (table 7; annex 8). However, we found no differences in satisfaction assessment based on income (annex 9) or technical skills (annex 10).

Table 7. Differences in experience satisfaction among those who have not yet visited the destination based on level of education

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
I will go on other virtual tours in the future	< univ. degree	37	33.20	U= 288.5 Z= -2.097	**.036***
	≥ univ. degree	22	24.20		

* Significant at 95% confidence level

Source: the authors

Differences in experience satisfaction between those who have visited the site in the past and those who have not

Finally, table 8 below (and annex 11) shows that there are no statistically significant differences in experience satisfaction between those who have physically visited the site and those who have not, except for two statements. Those who have not visited the tourism objective yet are more likely than those who have to take other virtual tours in the future. Our study has also shown that virtual tours are more effective in improving the image of the tourist destination when applied to tourists who have not visited the destination in the past (table 8).

Table 8. Differences in experience satisfaction between those who have visited and those who have not visited the site

Satisfaction with experience	Physically visited	N	Mean ranks	Test statistics	p-value
I will go on other virtual tours in the future	Yes	30	37.77	U= 1102.0 Z= 2.056	**.040***
	No	59	48.68		
The image of the tourist destination has improved as a result of this virtual tour	Yes	30	37.20	U= 1119.0 Z= 2.149	**.032***
	No	59	48.97		

* Significant at 95% confidence level

Source: the authors

Conclusion

This study has shown that almost all of our respondents were satisfied with their VR experience. They have also agreed that their image of the destination has improved after the VT. Moreover, based on the results of our research, we could also safely conclude that VR technology does improve users' satisfaction with visiting a destination and can positively influence their intention to visit or re-visit a destination and to recommend it to others.

In terms of satisfaction differences based on socio-demographic characteristics, we found that older participants may benefit more from the VR tours than younger participants as they may be more appreciative of these technologies. Generation Z users are practically digital natives; they are more knowledgeable of new technologies which they use frequently, thus, they may be more difficult to impress. This is congruent with findings by Marasco & Balbi

(2019) and Akhtar et al. (2021) who concluded that older tourists are more likely to be highly satisfied with their VR experience and should be the main targets of destination marketers.

Our findings also pointed to the conclusion that women who have not yet visited the destination are more likely than men to feel totally immersed or involved during the VTs. It goes without saying that they may represent more suitable targets for promoting a destination. We also found that participants with less than a college degree are more likely to take other VTs in the future than more educated participants. Both conclusions are consistent with findings of previous studies (see Marasco & Balbi, 2019). Finally, according to our research, income and technical skills cannot be used as discriminants when studying users' satisfaction with their VR experience and their subsequent perception of the destination.

Finally, our study found that it is almost equally effective to use VR for destination marketing before and after tourists visit the site; however, the technology may be more useful in improving the image of the destination when applied before the physical visit to the tourism destination.

The main limitation of this study is represented by the relatively small number of respondents. However, given the fact that the main methodology is a quasi-experiment we were guided by Cohen, Manion, and Morrison's (2007, p. 10) recommendation that all groups include at least 15 participants. Still, other studies based on larger groups would be needed to test our findings.

Another limitation comes from the sampling method we used as the population sample is not representative. In fact, neither group is demographically balanced. For example, they are clearly skewed towards the younger generation as very few participants over 30 were included in either group. This anomaly happened because older people (especially over 40) were reluctant to take part in our experiment. Yet, for future studies it would desirable to investigate how people over 40 or 50 feel about taking virtual tours of a destination.

VR technology will gradually become one of the important technologies to promote the digitalization of tourism information in the future (Talafubieke, Mai, and Xialifuan, 2021). The results of our study show that VT can be used for destination marketing. For example, tourism agencies could use VR to give potential tourists a taste of the place before buying a travel package.

REFERENCES

1. Abrash, M. (2018), *Welcome to the virtual age: AR, VR and the future of connection*, https://www.oculus.com/enus/blog/welcome-to-the-virtual-age
2. Akhtar, N., Khan, N., Khan, M.M., Ashraf, S., Hashmi, M.S., Khan, M.M., & Hishan, S.S. (2021), *Post-COVID 19 tourism: Will digital tourism replace mass tourism?,* Sustainability, 13, 10, 5352.
3. Baños, R.M., Botella, C., Alcañiz, M., Llaño, V., Guerrero, B., & Rey, B. (2004), *Immersion and emotion: Their impact on the sense of presence*, CyberPsychology & Behavior, 7, 8, 734-741.
4. Beck, J., Rainoldi, M., & Egger, R. (2019), *Virtual reality in tourism: A state-of-the-art review*, Tourism Review, 74, 3, 586–612.
5. Berg, L. P., and Vance, J. M. (2017), *Industry use of virtual reality in product design and manufacturing: a survey*, Virtual Reality, 21, 1, 1-17.
6. Berger, H., Dittenbach, M., Merkl, D., Bogdanovych, A., Simoff, S., & Sierra, C. (2007), *Opening new dimensions for e-tourism*, Virtual Reality, 11, 2, 75–87.
7. Bogicevic, V., Seo, S., Kandampully, J. A., Liu, S. Q., & Rudd, N. A. (2019), *Virtual reality presence as a preamble of tourism experience: The role of mental imagery*, Tourism Management, 74, 55–64.
8. Buhalis, D. (2000), *Marketing the competitive destination of the future*, Tourism Management, 21, 1, 97–116.
9. Cabello, J., Collado, A., Cruz-Lara, S., Armisen, A., Franco, J., Janer, J., Oyarzun, D. & Geraerts, R. (2011), *Standards in virtual worlds. Virtual travel use case metaverse1 project*, Journal of Virtual Worlds Research, 4, 3, 1–5.
10. Cheong, R. (1995), *The virtual threat to travel and tourism*, Tourism Management, 16, 6, 417–422.
11. Cho, Y.H.; Wang, Y.; Fesenmaier, D.R. (2002), *Searching for experiences: The web-based virtual tour in tourism marketing*, Journal of Travel & Tourism Marketing, 12, 1–17.
12. Cohen, L., Manion, L., & Morrison, K. (2007), Research methods in education, London: Routledge
13. Daasi, M. & Debbabi, S. (2021), *Intention to reuse AR-based apps: The combined role of the sense of immersion, product presence and perceived realism*, Information & Management, 58, 4, 103453.
14. Dewailly, J. M. (1999), *Sustainable tourist space: From reality to virtual reality?,* Tourism Geographies, 1, 1, 41–55.
15. Dueholm, J., & Smed, K. M. (2014), *Heritage authenticities – a case study of authenticity perceptions at a Danish heritage site*, Journal of Heritage Tourism, 9, 4, 285–298.
16. Escobar-Rodriguez, T. & Carvajal-Trujillo, E. (2014), *Online purchasing tickets for low-cost carriers: An application of the unified theory of acceptance and use of technology (UTAUT) model*, Tourism Management, 43, 70-88.

17. Fan, X., Jiang, X., Deng, N. (2022), *Immersive technology: A meta-analysis of augmented/virtual reality applications and their impact on tourism experience*, Tourism Management, 91, 104534.
18. Flavian, C., Ibanez-Sanchez, S., & Orus, C. (2021), *Impacts of technological embodiment through virtual reality on potential guests' emotions and engagement*, Journal of Hospitality Marketing & Management, 30, 1, 1–20.
19. Flavian, C., Ibanez-Sanchez, S., & Orus, C. (2019), *The impact of virtual, augmented and mixed reality technologies on the customer experience*, Journal of Business Research, 100, 547–560.
20. Gibson, A. & O'Rawe, M. (2017), Virtual reality as a promotional tool: Insights from a consumer travel fair. In, Jung, T & tom Dieck, M.C. (eds.), Augmented Reality and Virtual Reality – Empowering Human, Place and Business (pp. 93-107). London: Springer.
21. Gonzalez, D.A.Z., Richards, D., & Bilgin, A.A. (2021), *Making it real: A study of augmented virtuality on presence and enhanced benefits of study stress reduction sessions*, International Journal of Human-Computer Studies, 147, 102579.
22. Govers, R., Go, F.M., & Kumar, K. (2007), *Promoting Tourism Destination Image*, Journal of Travel Research, 46, 1, 15-23.
23. Griffin, T. & Muldoon, M. (2022), *Exploring virtual reality experiences of slum tourism*, Tourism Geographies, 22, 6-7, 934-953.
24. Griffin, T., Giberson, J., Lee, S. H., Guttentag, D., & Kandaurova, M. (2017), *Virtual reality and implications for destination marketing*, Tourism Travel and Research Association: Advancing Tourism Research Globally, 29.
25. Guerra, J., Pinto, M., & Beato, C. (2015), *Virtual reality shows. A new vision for tourism and heritage*, European Scientific Journal, Special Edition, 49-54, Retrieved July 12, 2023, from https://core.ac.uk/download/pdf/236412918.pdf.
26. Guttentag, D. (2010), *Virtual reality: Applications and implications for tourism*, Tourism Management, 31, 5, 637–651.
27. Gutiérrez, M., Vexo, F., & Thalmann, D. (2008), *Stepping into virtual reality*, London: Springer.
28. Han, D.I., tom Dieck, M.C., & Jung, T. (2018), *User experience model for augmented reality applications in urban heritage tourism*, Journal of Heritage Tourism, 13, 1, 46-61.
29. He, Z., Wu, L., & Li, X.R. (2018), *When art meets tech: The role of augmented reality in enhancing museum experiences and purchase intentions*, Tourism Management, 68, 127-139.
30. Huang, S., & Hsu, C. H. (2009), *Effects of travel motivation, past experience, perceived constraint, and attitude on revisit intention*, Journal of Travel Research, 48, 1, 29-44.
31. Huang, Y.C., Backman, K.F., Backman, S.J., & Chang, L.L. (2016), *Exploring the implications of virtual reality technology in tourism marketing: An integrated research framework*, International Journal of Tourism Research, 18, 2, 116-128.
32. Hughes, H. L. (2008), *Visitor and non-visitor destination images: The influence of political instability in South-Eastern Europe*, Tourism: An International Interdisciplinary Journal, 56, 1, 59–74.

33. Hyun, M.Y. & O'Keefe, R.M. (2012), *Virtual destination image: testing a telepresence model*, Journal of Business Research, 65, 1, 29-35.
34. Israel, K., Zerres, C., & Tscheulin, D. K. (2019), *Presenting hotels in virtual reality: Does it influence the booking intention?,* Journal of Hospitality and Tourism Technology, 10, 3, 473–493.
35. Jayawardena, C. (2019), *What are the key innovative strategies needed for future tourism in the world?,* Worldwide Hospitality and Tourism Themes, 11, 2, 235-247.
36. Jung, R. & Khoo-Lattimore, C. (2019), *New realities: A systematic literature review on virtual reality and augmented reality in tourism research*, Current Issues in Tourism, 22, 17, 2056-2081.
37. Kim, M. J., & Hall, C. M. (2019), *A hedonic motivation model in virtual reality tourism: Comparing visitors and non-visitors*, International Journal of Information Management, 46, 236–249.
38. Kim, M.J.; Lee, C.-K.; Jung, T. (2020), *Exploring Consumer Behavior in Virtual Reality Tourism Using an Extended Stimulus-Organism-Response Model*, Journal of Travel Research, *59*, 69–89.
39. Kim, S., Lehto, X. and Kandampully, J. (2019), *The role of familiarity in consumer destination image formation*, Tourism Review, 74, 4, 885-901.
40. Lee, K.M. (2004), *Presence, explicated*, Communication Theory, 14, 1, 27-50.
41. Lee, W., Gretzel, U., & Law, R. (2010), *Quasi-trial experiences through sensory information in destination websites*, Journal of Travel Research, 49, 3, 310-322.
42. Lin, L.-P.; Huang, S.-C.; Ho, Y.-C. (2020), *Could virtual reality effectively market slow travel in a heritage destination?,* Tourism Management, 78, 104027.
43. Loureiro, S. M. C., Guerreiro, J., & Ali, F. (2020), *20 years of research on virtual reality and augmented reality in tourism context: A text-mining approach*, Tourism Management, 77, 104028.
44. Lu, J., Xiao, X., Xu, Z., Wang, C., Zhang, M., & Zhou, Y. (2022), *The potential of virtual tourism in the recovery of tourism industry during the COVID-19 pandemic,* Current Issues in Turism, 25, 3, 441-457.
45. Lu, X. & Hsiao, K.-L. (2022), *Effects of diffusion of innovations, spatial presence, and flow on virtual reality shopping*, Frontiers in Psychology, *13*, 941248.
46. Marasco, A.; Balbi, B. (2019), *Designing accessible experiences for heritage visitors through virtual reality*, E-Review of Tourism Research, 17, 426–443.
47. Marasco, A., Buonincontri, P., van Niekerk, M., Orlowski, M., & Okumus, F. (2018), *Exploring the role of next-generation virtual technologies in destination marketing*, Journal of Destination Marketing & Management, 9, 138–148.
48. Martins, J., Goncalves, R., Branco, F., Barbosa, L., Melo, M., & Bessa, M. (2017), *A multi-sensory virtual experience model for thematic tourism: A Port wine application proposal*, Journal of Destination Marketing & Management, 6, 2, 103-109.
49. Mascho, E., & Singh, N. (2013), *Virtual tourism: Use of 'second life' for destination marketing*, Anatolia, 25, 1, 140–143.
50. Mohanty, P., Hassan, A., & Ekis, E. (2020), *Augmented reality for relaunching tourism post-Covid-19: Socially distant, virtually connected*, Worldwide Hospitality and Tourism Themes, 12, 6, 753-760.

51. Moorhouse, N., tom Dieck, M.C., & Jung, T. (2018), Technological innovations transforming the consumer retail experience: A review of the literature. In, Jung, T. & tom Dieck, M. (eds.). Augmented Reality and Virtual Reality. Progress in IS (pp. 133-143). Cham, Switzerland: Springer International.
52. Moro, S., Rita, P., Ramos, P., & Esmerado, J. (2019), *Analyzing recent augmented and virtual reality developments in tourism*, Journal of Hospitality and Tourism Technology, 10, 571-586.
53. Mura, P., Tavakoli, R., & Sharif, S.P. (2017), *"Authentic but not too much": Exploring perceptions of authenticity of virtual tourism*, Information Technology & Tourism, 17, 2, 145-159.
54. Navarrette, T. (2019), *Digital heritage tourism: Innovations in museums*, World Leisure Journal, 61, 3, 200-214.
55. Nguyen, T.B.T., Le, T.B.N., & Chau, N.T. (2023), *How VR technological features prompt tourists' visiting intention: An integrated approach*, Sustainability, 15, 6, 4765.
56. Pantano, E., and Servidio, R. (2011), *An exploratory study of the role of pervasive environments for promotion of tourism destinations*, Journal of Hospitality and Tourism Technology, 2, 1, 50-65.
57. Roughead M. (2017), *Scotland transposed to VR in effort to lure tech-savvy visitor*, The Drum, July 3. Retrieved July 17, 2023, from http://www.thedrum.com/news/2017/03/07/scotland-transposed-vr-effortlure-tech-savvy-visitors
58. Sanchez-Vives, M., & Slater, M. (2005), *From presence to consciousness through virtual reality*, Nature Reviews Neuroscience, 6, 4, 332–339.
59. Slater, M., & Usoh, M. (1994), *Body centred interaction in immersive virtual environments*, Artificial Life and Virtual Reality, 1, 125–148.
60. Subawa, N.S., Widhiasthini, N.W., Astawa, I.P., Dwiatmadja, C., & Permatasari, N.P.I. (2021), *The practices of virtual reality marketing in the tourism sector, a case study of Bali, Indonesia*, Current Issues in Tourism, 24, 23, 3284-3295.
61. Sussmann, S., & Vanhegan, H. (2000), *Virtual reality and the tourism product. Substitution or complement?,* European Conference on Information Systems (ECIS) 2000 Proceedings 117, 1077-1083. http://aisel.aisnet.org/ecis2000/117.
62. Talafubieke, M., Mai, S., & Xialifuan, N. (2021), *Evaluation of the virtual economic effect of tourism product emotional marketing based on virtual reality*, Frontiers in Psychology, 12, 759268.
63. Thomas, W.A. & Carey, S. (2005), *Actual/virtual visits: What are the links?,* International Conferences on Museums and the Web, Vancouver, British Columbia, Canada.
64. Tussyadiah, I.P., Wang, D., Jung, T.H., & tom Dieck, M.C. (2018), *Virtual reality, presence, and attitude change: Empirical evidence from tourism*, Tourism Management, 66, 140-154.
65. Verma, S., Warrier, L., Bolia, B., & Mehta, S. (2022), *Past, present, and future of virtual tourism – a literature review*, International Journal of Information Management Data Insights, 2, 2, 100085.

66. Vishwakarma, P., Mukherjee, S., & Datta, B. (2020), *Travelers' intention to adopt virtual reality: A consumer value perspective*, Journal of Destination Marketing & Management, 17, 100456.
67. Wan, C., Tsaur, S., Chiu, Y., & Chiou, W. (2007), *Is the advertising effect of virtual experience better or contingent on different travel destinations?,* Information Technology and Tourism, 9, 1, 45–54.
68. Wedel, M., Bigné, E., & Zhang, J. (2020), *Virtual and augmented reality: Advancing research in consumer marketing*, International Journal of Research in Marketing, 37, 3, 443-465.
69. Wei, W. (2019), *Research progress on Virtual reality (VR) and Augmented Reality (AR) in tourism and hospitality*, Journal of Hospitality and Tourism Technology, 10, 4, 539-570.
70. Williams, P., & Hobson, J. S. (1995), *Virtual reality and tourism: Fact or fantasy?,* Tourism Management, 16, 6, 423–427.
71. Wiltshier, P., & Clarke, A. (2017), *Virtual cultural tourism: Six pillars of VCT using co-creation, value exchange and exchange value*, Tourism & Hospitality Research, 17, 4, 372-383.
72. Yung, R. & Khoo-Lattimore, C. (2019), *New realities: A systematic literature review on virtual reality and augmented reality in tourism research*, Current Issues in Tourism, 22, 17, 2056-2081.
73. Zarzuela, M. M., Pernas, F. J. D., Calzón, S. M., Ortega, D. G., & Rodríguez, M. A. (2013), *Educational tourism through a virtual reality platform*, Procedia Computer Science, 25, 382– 388.

Annexes

Annex 1. Differences in experience satisfaction among those who already visited the destination based on gender

Satisfaction with experience	Gender	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is accurate	Male	9	18.67	U= 66.0 Z= -1.385	.209
	Female	21	14.14		
Information about the destination is reliable	Male	9	17.33	U= 78.0 Z= -.803	.476
	Female	21	14.71		
Information about the destination is well-organized	Male	9	17.67	U= 75.0 Z= -.937	.397
	Female	21	14.57		
During the virtual tour I felt completely immersed	Male	9	17.06	U= 80.5 Z= -.661	.533
	Female	21	14.83		
During the virtual tour I felt totally involved	Male	9	17.39	U= 77.5 Z= -.812	.449
	Female	21	14.69		
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	Male	9	16.44	U= 86.0 Z= -.407	.722
	Female	21	15.10		
The virtual tour was very pleasant	Male	9	15.89	U= 91.0 Z= -.172	.894
	Female	21	15.33		
The virtual tour was very interesting	Male	9	16.00	U= 90.0 Z= -.220	.859
	Female	21	15.29		
I learned a lot after this virtual tour	Male	9	18.83	U= 64.5 Z= -1.399	.178
	Female	21	14.07		
I am very satisfied with this virtual tour experience	Male	9	17.89	U= 73.0 Z= -1.017	.349
	Female	21	14.48		
I will go on other virtual tours in the future	Male	9	19.44	U= 59.0 Z= -1.689	.114
	Female	21	13.91		
I will recommend the virtual tour to others	Male	9	19.06	U= 62.5 Z= -1.642	.150
	Female	21	13.98		

Satisfaction with experience	Gender	N	Mean ranks	Test statistic (t)	p-value
I enjoyed virtually revisiting the location I visited physically in the past.	Male	9	18.44	U= 68.0 Z= -1.367	.244
	Female	21	14.24		
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	Male	9	17.33	U= 78.0 Z= -803	.476
	Female	21	14.71		
The image of this tourism destination has improved after this virtual tour	Male	9	18.06	U= 71.5 Z= -1.074	.304
	Female	21	14.40		
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	Male	9	19.50	U= 58.5 Z= -1.682	.104
	Female	21	13.79		
During this virtual tour I was able to study the location in greater detail	Male	9	19.00	U= 63.0 Z= -1.476	.164
	Female	21	14.00		
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	Male	9	17.39	U= 77.5 Z= -.812	.449
	Female	21	14.69		
This virtual tour influenced my decision to revisit this tourism destination	Male	9	15.67	U= 93.0 Z= -.070	.965
	Female	21	15.43		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	Male	9	15.50	U= 94.5 Z= 0	1.000.
	Female	21	15.50		
I think using VR technology is very useful to visit a tourist destination/attraction	Male	9	16.28	U= 87.5 Z= -.347	.756
	Female	21	15.17		

* Significant at 95% confidence level

Annex 2. Differences in experience satisfaction among those who already visited the destination based on age

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is accurate	18-25 yr.	22	13.98	U= 121.5 Z= 1.687	.118
	26+ yr.	8	19.69		
Information about the destination is reliable	18-25 yr.	22	13.14	U= 140.0 Z= 2.621	**.013***
	26+ yr.	8	22.00		
Information about the destination is well-organized	18-25 yr.	22	14.09	U= 119.0 Z= 1.544	.156
	26+ yr.	8	19.38		
During the virtual tour I felt completely immersed	18-25 yr.	22	14.68	U= 106.0 Z= .881	.420
	26+ yr.	8	17.75		
During the virtual tour I felt totally involved	18-25 yr.	22	13.95	U= 122.0 Z= 1.682	.118
	26+ yr.	8	19.75		
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	18-25 yr.	22	15.00	U= 99.0 Z= .585	.629
	26+ yr.	8	16.88		
The virtual tour was very pleasant	18-25 yr.	22	14.34	U= 113.5 Z= 1.296	.237
	26+ yr.	8	18.69		
The virtual tour was very interesting	18-25 yr.	22	14.34	U= 113.5 Z= 1.293	.237
	26+ yr.	8	18.69		
I learned a lot after this virtual tour	18-25 yr.	22	13.59	U= 130.0 Z= 2.029	**.049***
	26+ yr.	8	20.75		
I am very satisfied with this virtual tour experience	18-25 yr.	22	14.18	U= 117.0 Z= 1.421	.185
	26+ yr.	8	19.13		
I will go on other virtual tours in the future	18-25 yr.	22	14.59	U= 108.0 Z= .986	.368
	26+ yr.	8	18.00		
I will recommend the virtual tour to others	18-25 yr.	22	14.68	U= 106.0 Z= .957	.420
	26+ yr.	8	17.75		

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
I enjoyed virtually revisiting the location I visited physically in the past.	18-25 yr.	22	13.82	U= 125.0 Z= 1.978	.087
	26+ yr.	8	20.13		
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	18-25 yr.	22	14.59	U= 108.0 Z= 1.008	.368
	26+ yr.	8	18.00		
The image of this tourism destination has improved after this virtual tour	18-25 yr.	22	13.11	U= 140.5 Z= 2.540	**0.12***
	26+ yr.	8	22.06		
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	18-25 yr.	22	13.61	U= 129.5 Z= 2.009	**.049***
	26+ yr.	8	20.69		
During this virtual tour I was able to study the location in greater detail	18-25 yr.	22	13.41	U= 134.0 Z= 2.234	**.031***
	26+ yr.	8	21.25		
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	18-25 yr.	22	13.84	U= 124.5 Z= 1.807	0.87
	26+ yr.	8	20.06		
This virtual tour influenced my decision to revisit this tourism destination	18-25 yr.	22	14.09	U= 119.0 Z= 1.507	.156
	26+ yr.	8	19.38		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	18-25 yr.	22	14.09	U= 119.0 Z= 1.524	.156
	26+ yr.	8	19.38		
I think using VR technology is very useful to visit a tourist destination/attraction	18-25 yr.	22	14.23	U= 116.0 Z= 1.439	.202
	26+ yr.	8	19.00		

* Significant at 95% confidence level

Annex 3. Differences in experience satisfaction among those who already visited the destination based on level of education

Satisfaction with experience	Ed. level	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	Less than uni. grad.	20	15.00	U= 110.0 Z= .472	.681
	Uni. grad. & postgr.	10	16.50		
Information about the destination is reliable	Less than uni. grad.	20	15.70	U= 96.0 Z= -.189	.880
	Uni. grad. & postgr.	10	15.10		
Information about the destination is well-organized	Less than uni. grad.	20	15.10	U= 108.0 Z= .374	.746
	Uni. grad. & postgr.	10	16.30		
During the virtual tour I felt completely immersed	Less than uni. grad.	20	16.45	U= 81.0 Z= -.872	.411
	Uni. grad. & postgr.	10	13.60		
During the virtual tour I felt totally involved	Less than uni. grad.	20	14.70	U= 116.0 Z= .742	.502
	Uni. grad. & postgr.	10	17.10		
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	Less than uni. grad.	20	15.45	U= 101.0 Z= .047	1.000
	Uni. grad. & postgr.	10	15.60		
The virtual tour was very pleasant	Less than uni. grad.	20	15.85	U= 93.0 Z= -.334	.779
	Uni. grad. & postgr.	10	14.80		
The virtual tour was very interesting	Less than uni. grad.	20	15.75	U= 95.0 Z= -.238	.846
	Uni. grad. & postgr.	10	15.00		
I learned a lot after this virtual tour	Less than uni. grad.	20	14.25	U= 125.0 Z= 1.133	.286
	Uni. grad. & postgr.	10	18.00		
I am very satisfied with this virtual tour experience	Less than uni. grad.	20	15.85	U= 93.0 Z= -.322	.779
	Uni. grad. & postgr.	10	14.80		
I will go on other virtual tours in the future	Less than uni. grad.	20	16.53	U= 79.5 Z= -.948	.373
	Uni. grad. & postgr.	10	13.45		
I will recommend the virtual tour to others	Less than uni. grad.	20	16.45	U= 81.0 Z= -948	.422
	Uni. grad. & postgr.	10	13.60		

Satisfaction with experience	Ed. level	N	Mean ranks	Test statistics	p-value
I enjoyed virtually revisiting the location I visited physically in the past.	Less than uni. grad.	20	15.25	U= 105.0 Z= .251	.846
	Uni. grad. & postgr.	10	16.00		
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	Less than uni. grad.	20	15.80	U= 94.0 Z= -.284	.812
	Uni. grad. & postgr.	10	14.90		
The image of this tourism destination has improved after this virtual tour	Less than uni. grad.	20	15.15	U= 107.0 Z= .318	.779
	Uni. grad. & postgr.	10	16.20		
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	Less than uni. grad.	20	15.05	U= 109.0 Z= .409	.713
	Uni. grad. & postgr.	10	16.40		
During this virtual tour I was able to study the location in greater detail	Less than uni. grad.	20	15.70	U= 96.0 Z= -.182	.880
	Uni. grad. & postgr.	10	15.10		
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	Less than uni. grad.	20	15.38	U= 102.5 Z= .116	.914
	Uni. grad. & postgr.	10	15.75		
This virtual tour influenced my decision to revisit this tourism destination	Less than uni. grad.	20	15.98	U= 90.5 Z= -.433	.681
	Uni. grad. & postgr.	10	14.55		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	Less than uni. grad.	20	16.40	U= 82.0 Z= -.830	.448
	Uni. grad. & postgr.	10	13.70		
I think using VR technology is very useful to visit a tourist destination/attraction	Less than uni. grad.	20	15.95	U= 91.0 Z= -.434	.713
	Uni. grad. & postgr.	10	14.60		

* Significant at 95% confidence level

Annex 4. Differences in experience satisfaction among those who already visited the destination based on income

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	< average	13	13.15	U= 141.0	.171
	≥ average	17	17.29	Z= 1.370	
Information about the destination is reliable	< average	13	14.62	U= 122.0	.650
	≥ average	17	16.18	Z= .517	
Information about the destination is well-organized	< average	13	13.46	U= 137.0	.281
	≥ average	17	17.06	Z= 1.178	
During the virtual tour I felt completely immersed	< average	13	15.77	U= 107.0	.902
	≥ average	17	15.29	Z= -.153	
During the virtual tour I felt totally involved	< average	13	13.58	U= 135.5	.300
	≥ average	17	16.67	Z= .270	
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	< average	13	13.88	U= 131.5	.385
	≥ average	17	16.74	Z= .930	
The virtual tour was very pleasant	< average	13	13.65	U= 134.5	.320
	≥ average	17	16.91	Z= .277	
The virtual tour was very interesting	< average	13	13.38	U= 138.0	.263
	≥ average	17	17.12	Z= .213	
I learned a lot after this virtual tour	< average	13	12.85	U= 145.0	.157
	≥ average	17	17.53	Z= 1.487	
I am very satisfied with this virtual tour experience	< average	13	14.77	U= 120.0	.711
	≥ average	17	16.06	Z= .415	
I will go on other virtual tours in the future	< average	13	14.08	U= 129.0	.457
	≥ average	17	16.59	Z= .814	
I will recommend the virtual tour to others	< average	13	15.12	U= 115.5	.837
	≥ average	17	15.79	Z= .237	

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
I enjoyed virtually revisiting the location I visited physically in the past.	< average	13	12.31	U= 152.0	.086
	≥ average	17	17.94	Z= 1.980	
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	< average	13	13.00	U= 143.0	.183
	≥ average	17	17.41	Z= 1.482	
The image of this tourism destination has improved after this virtual tour	< average	13	13.12	U= 141.5	.198
	≥ average	17	17.32	Z= 1.338	
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	< average	13	13.08	U= 142.0	.198
	≥ average	17	17.35	Z= 1.361	
During this virtual tour I was able to study the location in greater detail	< average	13	13.04	U= 142.5	.183
	≥ average	17	17.38	Z= 1.387	
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	< average	13	14.19	U= 127.5	.483
	≥ average	17	16.50	Z= .751	
This virtual tour influenced my decision to revisit this tourism destination	< average	13	13.58	U= 135.5	.300
	≥ average	17	16.97	Z= 1.084	
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	< average	13	12.65	U= 147.5	.123
	≥ average	17	17.68	Z= 1.624	
I think using VR technology is very useful to visit a tourist destination/attraction	< average	13	14.46	U= 124.0	.592
	≥ average	17	16.29	Z= .612	

* Significant at 95% confidence level

Annex 5. Differences in experience satisfaction among those who already visited the destination based on technical skills

Satisfaction with experience	Technical skills	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	Yes	18	15.92	U= 100.5 Z= -.341	.755
	No	12	14.88		
Information about the destination is reliable	Yes	18	15.00	U= 117.0 Z= .682	.723
	No	12	16.25		
Information about the destination is well-organized	Yes	18	16.33	U= 93.0 Z= -.674	.545
	No	12	14.25		
During the virtual tour I felt completely immersed	Yes	18	16.44	U= 91.0 Z= -.751	.491
	No	12	14.08		
During the virtual tour I felt totally involved	Yes	18	16.28	U= 94.0 Z= -.625	.573
	No	12	14.33		
During the virtual tour I felt that I actually returned to the destination I visited physically in the past	Yes	18	17.61	U= 70.0 Z= -1.701	.113
	No	12	12.33		
The virtual tour was very pleasant	Yes	18	16.53	U= 89.5 Z= -.848	.439
	No	12	13.96		
The virtual tour was very interesting	Yes	18	16.00	U= 99.0 Z= -.412	.723
	No	12	14.75		
I learned a lot after this virtual tour	Yes	18	17.47	U= 72.5 Z= -1.548	.134
	No	12	12.54		
I am very satisfied with this virtual tour experience	Yes	18	15.97	U= 99.5 Z= -.376	.723
	No	12	14.79		
I will go on other virtual tours in the future	Yes	18	16.89	U= 83.0 Z= -1.112	.305
	No	12	13.42		
I will recommend the virtual tour to others	Yes	18	16.50	U= 90.0 Z= -.864	.465
	No	12	14.00		

Satisfaction with experience	Technical skills	N	Mean ranks	Test statistics	p-value
I enjoyed virtually revisiting the location I visited physically in the past.	Yes	18	16.92	U= 82.5 Z= -1.230	.285
	No	12	13.38		
The image of the tourist destination after this virtual tour corresponds to the image I made after visiting the destination	Yes	18	17.61	U= 70.0 Z= -1.729	.113
	No	12	12.33		
The image of this tourism destination has improved after this virtual tour	Yes	18	15.72	U= 104.0 Z= -.175	.884
	No	12	15.17		
During this virtual tour of the tourist destination I noticed things that I had not been able to notice when I visited the place physically (I learned new things about the tourist destination)	Yes	18	17.25	U= 76.5 Z= -1.377	.185
	No	12	12.88		
During this virtual tour I was able to study the location in greater detail	Yes	18	17.14	U= 78.5 Z= -1.293	.215
	No	12	13.04		
Thanks to my participation in this virtual tour, the satisfaction with the experience I had at the tourism destination increased	Yes	18	16.19	U= 95.5 Z= -.559	.602
	No	12	14.46		
This virtual tour influenced my decision to revisit this tourism destination	Yes	18	17.11	U= 79.0 Z= -1.272	.232
	No	12	13.08		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased.	Yes	18	15.89	U= 101.0 Z= -.311	.787
	No	12	14.92		
I think using VR technology is very useful to visit a tourist destination/attraction	Yes	18	16.28	U= 94.0 Z= -.649	.573
	No	12	14.33		

* Significant at 95% confidence level

Annex 6. Differences in experience satisfaction among those who have not yet visited the destination based on gender

Satisfaction with experience	Gender	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is accurate	Male	18	28.58	U= 394.5 Z= .457	.648
	Female	41	30.62		
Information about the destination is reliable	Male	18	28.03	U= 404.5 Z= .650	.515
	Female	41	30.87		
Information about the destination is well-organized	Male	18	26.89	U= 425.0 Z= 1.009	.313
	Female	41	31.37		
During the virtual tour I felt completely immersed	Male	18	23.00	U= 495.0 Z= 2.225	**.026***
	Female	41	33.07		
During the virtual tour I felt totally involved	Male	18	23.47	U= 486.5 Z= 2.074	**.038***
	Female	41	32.87		
During the virtual tour I felt that I was physically present at the tourism site	Male	18	21.31	U= 525.5 Z= 2.661	**.008***
	Female	41	33.82		
The virtual tour was very pleasant	Male	18	26.75	U= 427.5 Z= .290	.290
	Female	41	31.43		
The virtual tour was very interesting	Male	18	24.17	U= 474.0 Z= 1.933	.053
	Female	41	32.56		
I learned a lot after this virtual tour	Male	18	25.19	U= 455.5 Z= 1.507	.132
	Female	41	32.11		
I am very satisfied with this virtual tour experience	Male	18	24.89	U= 461.0 Z= 1.623	.105
	Female	41	32.24		
I will go on other virtual tours in the future	Male	18	28.94	U= 388.0 Z= .353	.724
	Female	41	30.46		
I will recommend the virtual tour to others	Male	18	28.28	U= 400.0 Z= .579	.562
	Female	41	30.76		

Satisfaction with experience	Gender	N	Mean ranks	Test statistic (t)	p-value
I enjoyed seeing virtually the location I planned to visit physically	Male	18	29.39	U= 380.0 Z= .194	.846
	Female	41	30.27		
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	Male	18	29.75	U= 373.5 Z= .079	.937
	Female	41	30.11		
The image of the tourist destination has improved as a result of this virtual tour	Male	18	28.97	U= 387.5 Z= .329	.742
	Female	41	30.45		
During this virtual tour I was able to study the location in greater detail	Male	18	26.97	U= 423.5 Z= .940	.347
	Female	41	31.33		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	Male	18	30.11	U= 367.0 Z= -.035	.972
	Female	41	29.95		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	Male	18	25.14	U= 456.5 Z= 1.541	.123
	Female	41	32.13		
I think using VR technology is very useful to visit a tourist destination/attraction	Male	18	25.44	U= 451.0 Z= 1.534	.125
	Female	41	32.00		

* Significant at 95% confidence level

Annex 7. Differences in experience satisfaction among those who have not yet visited the destination based on age

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is accurate	18-25 yr.	33	30.44	U= 414.5 Z= -.241	.810
	26+ yr.	26	29.44		
Information about the destination is reliable	18-25 yr.	33	27.20	U= 521.5 Z= 1.572	.116
	26+ yr.	26	33.56		
Information about the destination is well-organized	18-25 yr.	33	30.58	U= 410.0 Z= -.317	.751
	26+ yr.	26	29.27		
During the virtual tour I felt completely immersed	18-25 yr.	33	26.71	U= 537.5 Z= 1.777	.076
	26+ yr.	26	34.17		
During the virtual tour I felt totally involved	18-25 yr.	33	28.48	U= 479.0 Z= .818	.413
	26+ yr.	26	31.92		
During the virtual tour I felt that I was physically present at the tourism site	18-25 yr.	33	26.97	U= 529.0 Z= 1.577	.115
	26+ yr.	26	33.85		
The virtual tour was very pleasant	18-25 yr.	33	29.48	U= 446.0 Z= .285	.775
	26+ yr.	26	30.65		
The virtual tour was very interesting	18-25 yr.	33	29.27	U= 453.0 Z= .410	.682
	26+ yr.	26	30.92		
I learned a lot after this virtual tour	18-25 yr.	33	29.56	U= 443.5 Z= .234	.815
	26+ yr.	26	30.56		
I am very satisfied with this virtual tour experience	18-25 yr.	33	27.79	U= 502.0 Z= 1.194	.232
	26+ yr.	26	32.81		
I will go on other virtual tours in the future	18-25 yr.	33	30.09	U= 426.0 Z= -.052	.959
	26+ yr.	26	29.88		
I will recommend the virtual tour to others	18-25 yr.	33	28.67	U= 473.0 Z= .762	.446
	26+ yr.	26	31.69		

Satisfaction with experience	Age	N	Mean ranks	Test statistic (t)	p-value
I enjoyed seeing virtually the location I planned to visit physically	18-25 yr.	33	25.41	U= 580.5 Z= 2.480	**.013***
	26+ yr.	26	35.83		
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	18-25 yr.	33	28.79	U= 469.0 Z= .651	.515
	26+ yr.	26	31.54		
The image of the tourist destination has improved as a result of this virtual tour	18-25 yr.	33	28.83	U= 467.5 Z= .636	.525
	26+ yr.	26	31.48		
During this virtual tour I was able to study the location in greater detail	18-25 yr.	33	27.11	U= 524.5 Z= 1.527	.127
	26+ yr.	26	33.67		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	18-25 yr.	33	26.52	U= 544.0 Z= 1.858	.063
	26+ yr.	26	34.42		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	18-25 yr.	33	26.09	U= 558.0 Z= 2.108	**.035***
	26+ yr.	26	34.96		
I think using VR technology is very useful to visit a tourist destination/attraction	18-25 yr.	33	30.94	U= 398.0 Z= -.538	.591
	26+ yr.	26	28.81		

* Significant at 95% confidence level

Annex 8. Differences in experience satisfaction among those who have not yet visited the destination based on level of education

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	< univ. degree	37	30.99	U= 370.5 Z= -.623	.534
	≥ univ. degree	22	28.34		
Information about the destination is reliable	< univ. degree	37	30.45	U= 390.5 Z= -.288	.774
	≥ univ. degree	22	29.25		
Information about the destination is well-organized	< univ. degree	37	30.11	U= 403.0 Z= -.069	.945
	≥ univ. degree	22	29.82		
During the virtual tour I felt completely immersed	< univ. degree	37	29.24	U= 435.0 Z= .471	.638
	≥ univ. degree	22	31.27		
During the virtual tour I felt totally involved	< univ. degree	37	31.23	U= 361.5 Z= -.765	.445
	≥ univ. degree	22	27.93		
During the virtual tour I felt that I was physically present at the tourism site	< univ. degree	37	28.88	U= 448.5 Z= .672	.502
	≥ univ. degree	22	31.89		
The virtual tour was very pleasant	< univ. degree	37	30.74	U= 379.0 Z= -.474	.636
	≥ univ. degree	22	28.75		
The virtual tour was very interesting	< univ. degree	37	31.11	U=366.0 Z= -.719	.472
	≥ univ. degree	22	28.14		
I learned a lot after this virtual tour	< univ. degree	37	31.55	U= 349.5 Z= -.934	.340
	≥ univ. degree	22	27.39		
I am very satisfied with this virtual tour experience	< univ. degree	37	30.61	U= 384.5 Z= -.378	.706
	≥ univ. degree	22	28.98		
I will go on other virtual tours in the future	< univ. degree	37	33.20	U= 288.5 Z= -2.097	**.036***
	≥ univ. degree	22	24.20		
I will recommend the virtual tour to others	< univ. degree	37	31.82	U= 339.5 Z= -1.201	.230
	≥ univ. degree	22	26.93		
I enjoyed seeing virtually the location I planned to visit physically	< univ. degree	37	28.51	U= 462.0 Z= .924	.355
	≥ univ. degree	22	32.50		

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	< univ. degree	37	29.82	U= 413.5 Z= .109	.913
	≥ univ. degree	22	30.30		
The image of the tourist destination has improved as a result of this virtual tour	< univ. degree	37	32.09	U= 329.5 Z= -1.314	.189
	≥ univ. degree	22	26.48		
During this virtual tour I was able to study the location in greater detail	< univ. degree	37	29.00	U= 444.0 Z= .608	.543
	≥ univ. degree	22	31.68		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	< univ. degree	37	29.36	U= 430.5 Z= .390	.697
	≥ univ. degree	22	31.07		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	< univ. degree	37	30.42	U= 391.5 Z= -.260	.795
	≥ univ. degree	22	29.30		
I think using VR technology is very useful to visit a tourist destination/attraction	< univ. degree	37	32.54	U= 313.0 Z= -1.674	.094
	≥ univ. degree	22	25.73		

* Significant at 95% confidence level

Annex 9. Differences in experience satisfaction among those who have not yet visited the destination based on income

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	< average	24	31.08	U= 394.0 Z= -.437	.662
	≥ average	35	29.26		
Information about the destination is reliable	< average	24	30.48	U= 408.5 Z= -.197	.843
	≥ average	35	29.67		
Information about the destination is well-organized	< average	24	30.73	U= 402.5 Z= -.295	.768
	≥ average	35	29.50		
During the virtual tour I felt completely immersed	< average	24	31.21	U= 391.0 Z= -.480	.631
	≥ average	35	29.17		
During the virtual tour I felt totally involved	< average	24	32.96	U= 349.0 Z= -1.174	.240
	≥ average	35	27.97		
During the virtual tour I felt that I was physically present at the tourism site	< average	24	29.27	U= 437.5 Z= .279	.780
	≥ average	35	30.50		
The virtual tour was very pleasant	< average	24	33.06	U= 346.5 Z= -1.246	.243
	≥ average	35	27.90		
The virtual tour was very interesting	< average	24	30.71	U= 403.0 Z= -.293	.769
	≥ average	35	29.51		
I learned a lot after this virtual tour	< average	24	28.96	U= 445.0 Z= .408	.683
	≥ average	35	30.71		
I am very satisfied with this virtual tour experience	< average	24	28.73	U= 450.5 Z= .504	.614
	≥ average	35	30.87		
I will go on other virtual tours in the future	< average	24	31.81	U= 376.5 Z= -.758	.448
	≥ average	35	28.76		
I will recommend the virtual tour to others	< average	24	31.63	U= 381.0 Z= -.683	.495
	≥ average	35	28.89		
I enjoyed seeing virtually the location I planned to visit physically	< average	24	28.92	U= 446.0 Z= .430	.667
	≥ average	35	30.74		

Satisfaction with experience	Income	N	Mean ranks	Test statistics	p-value
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	< average	24	31.52	U= 383.5 Z= -.601	.548
	≥ average	35	28.96		
The image of the tourist destination has improved as a result of this virtual tour	< average	24	27.67	U= 476.0 Z= .935	.350
	≥ average	35	31.60		
During this virtual tour I was able to study the location in greater detail	< average	24	26.73	U= 498.5 Z= 1.269	.240
	≥ average	35	32.24		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	< average	24	25.48	U= 528.5 Z= 1.772	.076
	≥ average	35	33.10		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	< average	24	26.73	U= 498.5 Z= 1.296	.195
	≥ average	35	32.24		
I think using VR technology is very useful to visit a tourist destination/attraction	< average	24	30.83	U= 400.0 Z= -.351	.726
	≥ average	35	29.43		

* Significant at 95% confidence level

Annex 10. Differences in experience satisfaction among those who have not yet visited the destination based on technical skills

Satisfaction with experience	Technical skills	N	Mean ranks	Test statistic (t)	p-value
Information about the destination is accurate	Yes	23	31.48	U= 380.0 Z= -.575	.565
	No	36	29.06		
Information about the destination is reliable	Yes	23	31.00	U= 391.0 Z= -.398	.691
	No	36	29.36		
Information about the destination is well-organized	Yes	23	32.80	U= 349.5 Z= -1.097	.273
	No	36	28.21		
During the virtual tour I felt completely immersed	Yes	23	32.02	U= 367.5 Z= -.775	.438
	No	36	28.71		
During the virtual tour I felt totally involved	Yes	23	33.59	U= 331.5 Z= -1.375	.169
	No	36	27.71		
During the virtual tour I felt that I was physically present at the tourism site	Yes	23	32.93	U= 346.5 Z= -1.084	.278
	No	36	28.13		
The virtual tour was very pleasant	Yes	23	30.78	U= 396.0 Z= -.307	.759
	No	36	29.50		
The virtual tour was very interesting	Yes	23	31.09	U= 389.0 Z= -.435	.664
	No	36	29.31		
I learned a lot after this virtual tour	Yes	23	33.09	U= 343.0 Z= -1.168	.243
	No	36	28.03		
I am very satisfied with this virtual tour experience	Yes	23	34.67	U= 306.5 Z= -1.790	.073
	No	36	27.01		
I will go on other virtual tours in the future	Yes	23	31.57	U= 378.0 Z= -.632	.528
	No	36	29.00		
I will recommend the virtual tour to others	Yes	23	32.11	U= 365.5 Z= -.855	.392
	No	36	28.65		
I enjoyed seeing virtually the location I planned to visit physically	Yes	23	34.09	U= 320.0 Z= -1.566	.117
	No	36	27.39		

Satisfaction with experience	Technical skills	N	Mean ranks	Test statistic (t)	p-value
The image of the tourist destination after this virtual tour corresponds to the image I made of the destination before the virtual tour	Yes	23	33.96	U= 323.0 Z= -1.508	.131
	No	36	27.47		
The image of the tourist destination has improved as a result of this virtual tour	Yes	23	32.83	U= 349.0 Z= -1.093	.274
	No	36	28.19		
During this virtual tour I was able to study the location in greater detail	Yes	23	33.20	U= 340.5 Z= -1.197	.231
	No	36	27.96		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	Yes	23	32.07	U= 366.5 Z= -.781	.435
	No	36	28.68		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	Yes	23	27.93	U= 461.5 Z= .790	.430
	No	36	31.32		
I think using VR technology is very useful to visit a tourist destination/attraction	Yes	23	28.61	U= 446.0 Z= .565	.572
	No	36	30.89		

* Significant at 95% confidence level

Annex 11. Differences in experience satisfaction between those who have visited and those who have not visited the site

Satisfaction with experience	Physically visited	N	Mean ranks	Test statistics	p-value
Information about the destination is accurate	Yes	30	43.90	U= 918.0 Z= .310	.756
	No	59	45.56		
Information about the destination is reliable	Yes	30	40.47	U= 1021.0 Z= 1.283	.199
	No	59	47.31		
Information about the destination is well-organized	Yes	30	38.55	U= 1078.5 Z= 1.806	.071
	No	59	48.28		
During the virtual tour I felt completely immersed	Yes	30	40.37	U= 1024.0 Z= 1.281	.200
	No	59	47.36		
During the virtual tour I felt totally involved	Yes	30	43.07	U= 943.0 Z= .535	.593
	No	59	45.98		
The virtual tour was very pleasant	Yes	30	43.58	U= 927.5 Z= .403	.687
	No	59	45.72		
The virtual tour was very interesting	Yes	30	42.13	U= 971.0 Z= .825	.410
	No	59	46.46		
I learned a lot after this virtual tour	Yes	30	38.47	U= 1081.0 Z= 1.777	.076
	No	59	48.32		
I am very satisfied with this virtual tour experience	Yes	30	40.48	U= 1020.5 Z= 1.248	.212
	No	59	47.30		
I will go on other virtual tours in the future	Yes	30	37.77	U= 1102.0 Z= 2.056	**.040***
	No	59	48.68		
I will recommend the virtual tour to others	Yes	30	43.87	U= 919.0 Z= .334	.738
	No	59	45.58		
The image of the tourist destination has improved as a result of this virtual tour	Yes	30	37.20	U= 1119.0 Z= 2.149	**.032***
	No	59	48.97		
During this virtual tour I was able to study the location in greater detail	Yes	30	42.58	U= 957.0 Z= .656	.512
	No	59	46.23		

Satisfaction with experience	Physically visited	N	Mean ranks	Test statistics	p-value
I think using VR technology is very useful to visit a tourist destination/attraction	Yes	30	45.33	U= 875.0 Z= -.099	.921
	No	59	44.83		
Participating in this virtual tour influenced my decision to visit this tourist destination in the near future.	Yes	30	40.48	U= 1020.5 Z= 1.234	.217
	No	59	47.30		
After participating in this virtual tour, my willingness to recommend the tourist destination to others has increased	Yes	30	42.60	U= 957.0 Z= .664	.507
	No	59	46.22		

* Significant at 95% confidence level