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An Empirical Study of Virtual Tour Experience in Tourism Context

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Abstract: *Technologies like virtual reality have the potential to create new ways of interaction between tourists and different tourist attractions. In this context, virtual tours can emerge as an innovative promotional tool that offers immersive experiences and provides a comprehensive understanding of a particular destination.*

This study aims to examine experience factors that influence satisfaction with virtual tours in several tourism sectors, namely, museums, national and nature parks, and tourism destinations. To measure variables in the research model, previously validated scales from the literature were adopted. Data was collected using an online questionnaire and analyzed with descriptive and multiple regression analyses.

The results reveal the significant impact of virtual tour experience on satisfaction, explaining how virtual tour features can enhance satisfaction with presented virtual content. Therefore, these results can benefit both academics and practitioners, by extending the present knowledge of virtual tour experience and measurement.

1. INTRODUCTION

The development of digital technologies like virtual reality supports and facilitates the creation of innovative tourism products and services that create immersive tourism experiences. Specifically, virtual tours serve as an effective promotional tool that may attract visitors to the destination, as well as an innovative and appealing way to experience tourism attractions in advance, that is in pre-journey phase. Accordingly, virtual tours allow users to experience attractions and destinations without actually physically visiting them. In this vein, El-Said and Aziz (2022) demonstrated that virtual tours are valuable promotional tools for creating future demand, they allow the location to be discovered by people who do not have the opportunity to visit the actual location in person, and are relevant for educational purposes, as well. Thus, the use of such a state-of-the art digital technology can be beneficial to both, tourism service providers, as well as to tourists and destination visitors.

The virtual tour is a simulation of an existing location that is composed of a sequence of video images (Osman et al., 2009), using sound effects, audio guidance, or text descriptions (El-Said & Aziz, 2022). In the tourism context, a virtual tour provides potential visitors destination experience, presented in the virtual environment (Huang et al., 2016).

Virtual tours may be experienced through the internet using a computer or using advanced technologies such as virtual reality (El-Said & Aziz, 2022). Indeed, virtual reality represents the main technical support for virtual tours, making virtual tours one of the most promising immersive technologies that can present both tangible and intangible attributes of a real location.

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This research aims to answer the call of Oklevik et al. (2021) for experience research based on multi-case research studies. Thus, to gain comprehensive insights into the tourism context, virtual tours from different tourism sectors were used (museums, national and nature parks, and tourism destinations). Furthermore, according to Panduputri and Novani (2021), the virtual tour experience has received little attention applying experience economy theory. Therefore, the present study incorporated four experience economy dimensions in the virtual tours experience context. In addition, past studies (e.g. El-Said & Aziz, 2022; Mastroberardino et al., 2022) addressed the topic of virtual tour experience in the context of the COVID-19 crisis, while the present study focuses on virtual tours as an integral, innovative part of the tourism offer.

Building on these assumptions, current research aims to address the following research questions:

RQ1: How do users perceive the virtual tour experience?

RQ2: What aspects of the virtual tour experience are important for achieving satisfaction with presented virtual content?

To answer these research questions, an empirical study was conducted, using virtual tours of museums, national and nature parks, and tourism destinations.

2. CONCEPTUAL FRAMEWORK

Mastroberardino et al. (2022) stated that experiences present personal creation with an emotional nature, generated by the interaction between the individual and the offer. Pine and Gilmore (1999) created experience economy theory and described experiences as the combination of four dimensions, namely, entertainment, education, aesthetics, and escapism. In the tourism context, experiences are the essence of travel and the key component of tourism product development (Stasiak, 2019).

Virtual reality (VR) refers to interactive display technologies that provide users with an immersive experience of exploring a virtual world (An et al., 2021). Specifically, the virtual tour itself can be considered an experience for the individuals who participate in it (Panduputri & Novani, 2021). In addition, virtual tour experiences involve direct users' interaction with virtual tours and represent their subjective responses. El-Said and Aziz (2022) found that perceived usefulness, perceived enjoyment, and perceived ease of use are important features of virtual tour design. The current study considers virtual tour experiences as a combination of basic experience economy elements, extended with the particular features of the technology environment. Therefore, for the present research, virtual tour experiences are conceptualized as a combination of education, entertainment, escapism, aesthetics, and ease of use, thus creating a five-dimensional construct.

In general, satisfaction can be defined as the overall evaluation of the experience of using a product or service (Kao et al., 2006). In the digital technology perspective, virtual reality experiential satisfaction reflects the satisfaction perceived from the VR content (Wu et al., 2020). Therefore, in the present research virtual tour satisfaction refers to the level of users' satisfaction with virtual tour experience.

In addition, experiences have a significant role in enhancing customer satisfaction. According to Pine and Gilmore (1999), customers who encounter a unique experience, maximize their satisfaction. Furthermore, in the context of adopting digital technology in tourism, past studies revealed that digital technology experiences directly impact tourist satisfaction. For instance, Pai et al. (2020) showed a significant association

between smart tourism technology experience and travel experience satisfaction. Rahimizhian et al. (2020) reported that experience dimensions of perceived enjoyment, autonomy, usefulness, and ease of use are significant predictors of satisfaction with 360-degree video experience. An et al. (2021) found a significant relationship between telepresence and focused attention as VR simulation experience dimensions, and satisfaction in VR travel context. Panduputri and Novani (2021) found that entertainment, aesthetics, and escapism as experience economy dimensions positively affect virtual tour satisfaction.

Therefore, the present study aims to test the following hypothesis:

Hypothesis One: Virtual tour experience dimensions have a significant effect on virtual tour satisfaction.

3. METHODOLOGY

Following the methodology from Panduputri and Novani (2021) using virtual tours of different types of destinations (e.g., cultural and historical, city and urban, nature and landscape, and thematic attractions), this study aims to examine experience factors that influence satisfaction with virtual tours in several tourism sectors, namely, museums, national and nature parks, and in tourism destinations. Selected virtual tours were designed as navigable reproduction with 360-degree view, offering reality impressions, and allowing users to individually explore the presented site.

To measure variables in the research model, previously validated scales from the literature were adopted. The virtual tour experience was operationalized with five dimensions (education, entertainment, escapism, aesthetics, and ease of use), adopted from Panduputri and Novani (2021) and El-Said and Aziz (2022). The virtual tour satisfaction construct was measured with three items from Rahimizhian et al. (2020). Both, virtual tour experience and virtual tour satisfaction were assessed on a scale from "strongly disagree" (score 1) to "strongly agree" (score 5).

An online questionnaire with a snowball sampling technique was used to collect the data. E-mails with links leading to virtual tours in several tourism sectors and links with questionnaires, accompanied with the invitation for participation in the survey, as well as requests for forwarding the e-mail were sent to randomly selected contacts. Data collection ended with 205 valid questionnaires.

Although the research is based on a convenience sampling procedure, s multiple case studies approach was used to meet the research objective and to obtain the data from different tourism sectors, which would lead to more comprehensive insights into the virtual tour experience in the tourism context. Namely, the data was collected based on virtual tours representing museums, national and nature parks, and tourism destinations.

Data was described with descriptive statistical analysis. In addition, Cronbach's alpha coefficients were calculated to assess the reliability of research constructs. For testing the main study hypothesis, multiple regression analysis was performed.

4. RESULTS

This section presents sample description, reliability scores for research constructs, perceived experience and satisfaction mean scores, as well as hypothesis testing results. Analysis was performed on 205 valid questionnaires.

The sample structure consisted of predominantly female respondents (68.3 per cent). In terms of age distribution, the majority was between 21 and 30 years of age (56.1 per cent), followed by those older than 41 (30.3 per cent). Most of them completed secondary school (56.6 per cent) or college or a higher level of education (41.4 per cent). Respondents were predominantly employed (55.1 per cent) or reported a student status (37.1 per cent).

In terms of virtual tour experience characteristics, the sample consisted of respondents who predominantly experienced a particular virtual tour for the first time (87.8 per cent), mostly up to 3 minutes (46.3 per cent), or between 4 and 5 minutes (39.0 per cent). The majority of the respondents accessed the particular virtual tour via mobile phone (58.0 per cent).

Table 1 summarises results of descriptive and reliability analyses for research constructs.

Table 1. Descriptive and reliability analyses' results

Constructs and dimensions	Mean	Standard deviation	Cronbach alpha	Number of items
Virtual tour experience	*3.69*	*0.843*	*0.957*	*17*
Education	3.58	0.969	0.892	4
Entertainment	3.87	0.929	0.853	3
Escapism	3.28	1.024	0.881	4
Aesthetics	3.89	0.946	0.894	3
Ease of use	4.00	0.917	0.860	3
Virtual tour satisfaction	*4.06*	*0.922*	*0.906*	*3*

Note: numbers in italics represent overall values for each construct

Source: Own research

As reported in Table 1, values of Cronbach's alpha coefficient are very high for both constructs, as well as for individual dimensions. These results meet recommendations from Hair et al. (2010), and suggest strong internal consistency and reliability of research constructs and dimensions.

With regard to descriptive analysis, mean scores reveal positive overall virtual tour experience (mean = 3.69), with "ease of use" and "aesthetics" as the best assessed virtual tour experience dimensions (mean = 4.0, and mean = 3.89, respectively). In addition, the overall mean score appointed to the virtual tour satisfaction construct reveals highly satisfied virtual tour participants.

Next, the impact of virtual tour experience dimensions on virtual tour satisfaction was examined, testing the main research hypothesis. For this purpose, multiple regression analysis was performed. In the regression model, virtual tour experience dimensions "education", "entertainment", "escapism", "aesthetics", and "ease of use" were independent variables, while the virtual tour satisfaction construct was the dependent variable. Table 2 presents multiple regression analysis results.

Table 2. Multiple regression analysis results

Independent variables	b	Beta	t	Sig.
Constant	0.451		2.839	0.005*
Education	0.131	0.138	2.149	0.033**
Entertainment	0.143	0.144	1.981	0.049**
Escapism	-0.065	-0.072	-1.336	0.183
Aesthetics	0.316	0.324	3.880	0.000*
Ease of use	0.391	0.389	5.864	0.000*
$F(5, 199) = 111.677$, $p < 0.01$; $R = 0.859$; $R^2 = 0.737$				

Note: dependent variable is virtual tour satisfaction; * - significant at 0.01 level; ** - significant at 0.05 level

Source: Own research

Results presented in Table 2 show that the relationship between virtual tour experience dimensions and virtual tour satisfaction is positive, strong and significant ($R = 0.859$, $p < 0.01$). What is more, F-statistics is significant, meaning that the model's independent variables significantly predict the dependent variable. In addition, virtual tour experience dimensions explained 73.7 per cent of the variance in the virtual tour satisfaction construct.

The highest individual significant impact on virtual tour satisfaction was demonstrated by the dimension "ease of use" ($\beta = 0.389$, $p < 0.01$), followed by the dimensions "aesthetics" ($\beta = 0.324$, $p < 0.01$), "entertainment" ($\beta = 0.144$, $p < 0.05$), and "education" ($\beta = 0.138$, $p < 0.05$). Only the dimension "escapism" did not demonstrate an individual significant impact on virtual tour satisfaction ($p > 0.05$).

According to the reported results, virtual tour experience dimensions (namely the combination of education, entertainment, escapism, aesthetics, and ease of use) are significant predictors of virtual tour satisfaction. These results confirm the main research hypothesis.

5. CONCLUSION

This research was conducted to highlight the factors of virtual tour experience that would influence virtual tour satisfaction in the context of the tourism sector. The results provide perceptions of virtual tour experience, assessment of satisfaction level, as well as support that the combination of virtual tour experience dimensions positively affects virtual tour satisfaction.

In particular, the results showed that about 74 per cent of virtual tour satisfaction is explained through the overall impact of the five experience dimensions included in the research model. This result reflects the strength of the proposed research model in predicting users' satisfaction with virtual tours and suggests that the combination of education, entertainment, escapism, aesthetics, and ease of use represents important and powerful virtual tour experience features that significantly affect users' satisfaction with virtual tours in the tourism context. Hence, the research hypothesis is supported.

To address the research questions proposed in this paper, the individual importance of each experience dimension will be analysed. Results showed a satisfactory level of overall virtual tour experience, revealing ease of use as the best-perceived feature of virtual tours, as well as the most dominant individual attribute in creating high levels of user' satisfaction. This result implies that virtual tour creators should consider simplicity, flexibility to different levels of technology competence, as well as ability for interaction when designing virtual tours.

Similarly, aesthetics was a highly perceived experience feature that had a significant individual impact on virtual tour satisfaction. This result indicates that virtual tours should be attractive, with a pleasing environment, and close attention to detail.

Next, entertainment was assessed as an important experience feature and demonstrated a significant individual effect in enhancing satisfaction with virtual tours. This result suggests that feelings of enjoyment, fun, amusement and pleasure, as well as unusual experiences, are important elements of virtual tour design.

In addition, education was a positively perceived feature of the virtual tour experience, and exhibited a significant individual effect on virtual tour satisfaction, as well. This result shows the

importance of learning experiences that should be incorporated in virtual tours, enabling users to learn something new, to make them more curious, and to acquire new knowledge or to expand the existing one.

On the other hand, although previous studies (e.g. Trunfio et al., 2019; Guo et al., 2023) reported escapism as an important dimension of digital experience, the results of the present study showed that the individual impact of the escapism dimension on virtual tour satisfaction was not significant. This may be explained by the fact that virtual tours in the present study were not designed to involve all the senses. Namely, according to Mastroberardino et al. (2022), virtual tours that use specially developed interfaces that involve all the senses in a realistic way (e.g. gloves, headphones, visors, etc.) create virtual interactions that provide users more sensory, interactively, and participatory involved experience.

This study contributes to virtual tour experience literature by applying a combination of experience economy theory dimensions (namely, education, entertainment, escapism, and aesthetics) in a virtual reality context and by extending the combination of these dimensions with the dimension "ease of use", as an important feature of digital technology experience. Additionally, this study empirically tested the role of these dimensions in creating virtual tour users' satisfaction. Current findings provide evidence that virtual tour experience dimensions are significant factors that have an impact on users' satisfaction, suggesting that positive virtual tour experience leads to highly satisfied virtual tour users. According to these results, virtual tours should be user-friendly, aesthetically appealing, entertaining, and educational to create highly satisfactory experiences that enhance the satisfaction of virtual tour users.

However, several limitations can be addressed by future research. Although the sample structure allows generalizability of the results since it includes several tourism sectors, future studies could be designed on larger samples that would allow comparison between particular tourism sectors. Besides, future research can test the role of other virtual tour experience features in predicting virtual tour satisfaction, as well as investigate experience and satisfaction constructs as antecedents of behavioral intentions in the virtual tour context.

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