virtual reality tourism

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Virtual Reality Tourism, Can it replace the real tourism experience?

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The Covid-19 pandemic brought a severe impact on tourism industry, as traveling for leisure was very restricted. Yet, the desire to travel and explore tourist destination created a necessity for various reasons. The aim of this study is to explore virtual reality usage to replace such a travel limitation. Previous studies mention that virtual reality application has been used to enhance tourism promotion. Therefore, this study seeks evidences to go beyond enhancing the experience. The data were collected by questionnaires that were distributed to the Millennials, and the returned questionnaires were from 280 respondents, with 230 valid respondents. The results indicate that presence and authenticity have significant influences on virtual reality usage, however, they have no significant influence on tourism experience. Emotion has no significant influence on virtual reality usage, but it has a significant influence on tourism experience. Virtual reality usage has a significant influence on tourism experience. Virtual reality also acts as a mediator between presence and authenticity on tourism experience. At the moment, virtual reality is affecting the tourism experience, although it is relatively weak.

CCS CONCEPTS • human centered computing • human computer interaction (HCI) • interaction paradigms + virtual reality

Additional Keywords and Phrases: virtual reality, tourism experience, social medias, the millennials

1 INTRODUCTION

During the time when authenticity is a big question mark, it is worth to explore on how perceived reality is shaped among the young generation, namely the millennials. Social medias have robbed the genuine experiences by exposing their viewers to somewhat artificially created happenings that are far different from the reality. Yet, this occurrence has bombarded this generation to dive into the false reality by incarcerating them with fomo, yolo, and other misleading conceptions about life [1]. Therefore, authentic experience has become a big issue in this perceived reality.

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Despite its controversy, social medias are still considered as the most effective media to promote tourism and trigger tourists to explore new destinations. Before the Covid-19 pandemic, social medias could provoke young people to find new pristine places and post the findings in the medias [2]. Social medias also promoted new businesses by making a hype and trend via influencers [3]. However, this growing trends fell apart during the Covid-19 pandemic. Yet, some influencers and players still managed to post their traveling contents in the social medias which stimulated others to travel and created the sense of fomo. During the pandemic, traveling for leisure was totally banned to contain the vast spread of the virus. With such a constraint, some travel agencies managed to create some traveling contents for their customers [4]. It was the beginning of the massive virtual reality use in the tourism world.

1.1 The aim of this study

The aim of this study is to explore the possibility whether virtual reality can replace the real tourism experience. As the Covid-19 pandemic once imprisoned the society to travel physically, alternative to escape the routine and heal the mind need to be invented. Virtual reality may be the answer for such a limitation to travel. Virtual Reality is a computer-based simulation with a three-dimensional (3D) image projection that is operated by equipment such as a helmet with a screen inside (using HDM or Head-Mounted Display) or gloves with sensors to display images that are like real reality. Its application in the tourism sector is to use Virtual Reality technology to project an image in the form of a tourist destination that is similar to the original tourist destination. Virtual Reality can be accessed through a device in the form of virtual glasses such as Oculus, Google Glass or through video recordings containing travel content in the form of video blogs (vlogs) [4].

1.2 Research questions

Each travel experience is unique and different, and what differs is how each individual interprets all the processes or activities they get [5]. The meanings obtained from each individual can come from emotions, a sense of presence, and a sense of authenticity that is experienced by individuals while traveling. According to Kim and Fesenmaier [6], emotions are the process of evaluating an experience. In the tourism context, it will be limited by looking at the three positive feelings experienced by someone while on a tour, namely joy, love, and positive surprise [7]. A sense of authentication or authenticity describes a characteristic that is real, reliable, genuine, direct, and true [8]. These three things will have an impact when someone uses virtual reality in traveling, because virtual reality offers an original environment that is "carried" or moved into the virtual world [9]. Therefore, the researchers want to see how emotion, presence, authenticity influence one's travel experience with virtual reality as the intervening variable.

1.3 Tourism experience concepts

People travel because they want to experience novelty feelings (experiences that are constantly new all the time), try new lifestyles, visit different places than before, and gain new knowledge [10]. Furthermore, according to McIntosh, Goeldner & Ritchie [11], there are four reasons why people travel, namely physical motivation (related to physical rest, health, sports), cultural aspects (related to art, music, historical heritage), interpersonal motivation (related to finding new friends, visiting relationships), and for status and prestige (ego needs and self-development). Motivation in traveling can also be teamed up with Maslow's hierarchy of

needs, which states five basic human needs, namely physiological needs, needs for safety, social needs or needs to be accepted by others, esteem needs or needs for appreciation, and self-actualization needs [12].

The motivation to travel will define tourism experience. Tourism is a combination of activities, services and industries that provide travel experiences: transportation, accommodation, places to eat and drink, shops, entertainment, activity facilities and other hospitality services available to individuals or groups traveling away from home [12]. Experience is defined as a process in which people experience the influence of objects, environments, situations and events, and other factors that play an active role as mediators of experience [13]. In the context of tourism, tourist experience can be interpreted as all the behavioral, perceptual, cognitive and emotional aspects that stem from tourist engagement with destinations and service providers, either explicitly or implicitly [5]. The concept of tourism experience can also be defined as the subjective mental state of participants towards tourism services [14]. To measure tourism experience, there are seven indicators that are used for this study, such as Learning, Enjoyment, Escape, Refreshment, Novelty, Involvement, Local culture [15].

2 RESEARCH METHOD

As this study is measuring the influences of independent variables on a dependent variable, the research method is following the quantitative research framework, especially the explanation research. The data were collected with questionnaires that were distributed to randomly selected respondents. The population for this study is the millennials because they are familiar with the information and communication technology (ICT). Due to unfavorable circumstances, the high Covid-19 pandemic which led to massive lockdowns and physical distancing, the sampling technique to reach respondents is the convenient sampling technique. Questionnaires were distributed to targeted respondents through emails and various social media platforms. Two important criteria for respondents are active travelers and familiar with ICT. The items in the questionnaire are constructed using Lickert Scale of 5 point, so the respondents could evaluate their opinion from strongly disagree to strongly agree. The 280 returned questionnaires then are processed with smartPLS to test the validity, reliability, and hypothesis. The hypothesis of this study are as follow

H1: it is suspected that emotion has a significant influence on tourist experience.
H2: it is suspected that presence has a significant influence on tourist experience
H3: it is suspected that authenticity has a significant influence on tourist experience.
H4: it is suspected that emotion has a significant influence on virtual reality.
H5: it is suspected that presence has a significant influence on virtual reality.
H6: it is suspected that authenticity has a significant influence on virtual reality.
H7: it is suspected that virtual reality has a significant influence on tourist experience.

3 FINDING AND DISCUSSIONS

The data were obtained from 280 returned questionnaires, which were distributed via various social media platforms, with 230 valid questionnaires. The respondents are 55 percent male, 45 percent between the age range of 26 to 35, 35 percent between the age range of 18 to 25, and traveling for leisure at least once a year in the last 4 years. The descriptive statistics from the questionnaires are summarized in Table 1. The values in Table 1 are categorized within the range of weak (1.00-2.33), medium (2.34-3.66), and strong (3.67-5.00).

Table 1. Descriptive statistics

Indicator Name	Mean	Standard Deviation
EMO01 (joy)	4.109	0.839
EMO02 (passion)	3.392	0.887
EMO03 (positive surprise)	4.063	0.770
PRE01 (spatial presence)	3.348	1.034
PRE02 (tactile engagement)	3.507	0.945
PRE03 (sensory presence)	3.475	1.066
AUT01 (object-related authenticity)	2.950	1.259
AUT02 (existential-related authenticity)	3.235	1.105
AUT03 (constructive-related authenticity)	3.729	0.931
VIR01 (authentic experience)	3.217	1.184
VIR02 (cognitive response)	3.584	0.871
VIR03 (emotional enjoyment)	3.629	0.760
VIR04 (emotional involvement)	3.724	0.913
VIR05 (attachment)	3.176	1.101
VIR06 (visit intention)	3.466	1.083
TE01 (learning)	4.226	0.804
TE02 (physical enjoyment)	4.163	0.802
TE03 (escape)	3.910	0.872
TE04 (refreshment)	4.032	0.802
TE05 (novelty)	3.688	1.045
TE06 (physical involvement)	4.149	0.749
TE07 (local culture)	3.882	0.900

From Table 1, it can be inferred that the respondents value tourism experience more on the learning (TE01) aspect while traveling because it has the highest mean score. It can be said that the respondents are eager to obtain new information and knowledge while exploring tourist destinations. However, the respondents value less on novelty (TE05) while traveling, as it is reflected by the lowest mean score. It can be interpreted that they are seeking famous spots by visiting familiar destinations. The respondents also give their opinions on using virtual reality for substituting physical traveling. By observing the highest and lowest score on virtual reality (VR), the respondents agree that virtual reality can provoke their emotional involvement (VIR04) while using it, but cannot create a strong attachment (VIR05) to its users. It seems that the means for presence (PRE) and authenticity (AUT) are medium. It can be interpreted that presence and authenticity are not the main reasons to experience while they are traveling.

To proceed to the hypothesis testing, there are several procedures to be conducted in order to comply with the smartPLS. The outer model is carried out to obtain the validity and reliability tests. The validity of this study is observed from the results of convergent validity test, discriminant validity test, and average variance extracted (AVE). After running the outer model, all constructs are above the value of 0.6, the standard score

to benchmark convergent validity. The values of each construct are also higher when they are compared to other constructs; it means all constructs pass the discriminant validity test. The values of all constructs' AVE are above 0.5, the standard benchmark for AVE. Then, the reliability can be observed from the results of Cronbach' alpha and composite reliability tests. The values of all constructs are above 0.7, the benchmark score for Cronbach's alpha. Therefore, all constructs are valid and reliable to proceed to the next stage, that is the hypothesis testing. The results of Cronbach's alpha, composite reliability, and average variance extracted are shown in Table 2.

Table 2. Construct reliability and validity

	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
EMO	0.812	0.861	0.723
PRE	0.800	0.802	0.714
AUT	0.767	0.863	0.660
VIR	0.830	0.840	0.545
TE	0.898	0.910	0.624

The next step is to conduct the inner model using smartPLS to obtain some important scores, such as R-square, path coefficient, and T-Statistics. The summary of the outer model is described in Figure 1.
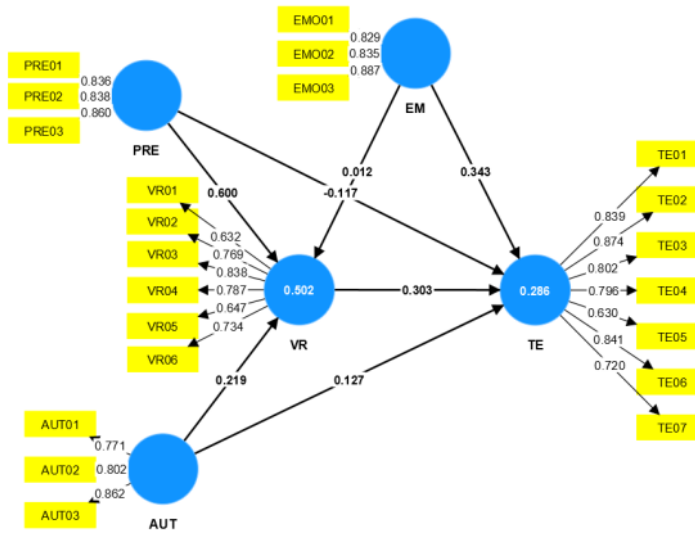

Figure 1. PLS algorithm

Figure 1 depicts the framework of this study. It shows the directions of the study from the independent variables of emotion (EMO), presence (PRE), and authenticity (AUT) to tourism experience (TE) through

virtual reality (VIR) as the intervening variable. It also summarizes the results of validity test, which can be used to examine the convergent validity and the discriminant validity.

The summary of the inner model is shown in Figure 2. It shows the results of the path coefficients, T-statistics values and P values, which can be used to examine the hypotheses. The results of the R-square can be observed in Table 3. The results of the path coefficients and hypothesis testing are observable in Table 4, too.
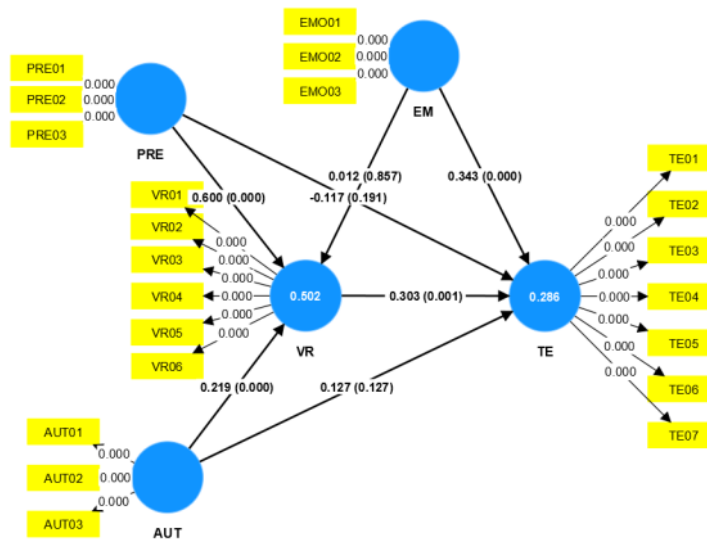

Figure 2. Bootstrapping of the research framework

Figure 2 summarizes the path coefficients, T-statistics, and P values. The hypothesis tests of this study are drawn from those results. It shows also the correlations among variables.

Table 3. R-square

	R-square	R-square adjusted
TE	0.286	0.273
VR	0.502	0.495

The adjusted R-square for this tourism experience is 0.273, which is relatively low. It means the model that affects the tourism experience is only 27.3 percent, and the rests are influenced by other variables that are not included in this study. The adjusted R-square for virtual reality is 0.495, meaning that the strength of the model is average. The independent variables influence 49.5 percent of the virtual reality usage in this study.

Table 4. Path coefficients

	Original sample	T-statistics	P values

H1: EMO -> TE	0.343	3.737	0.000
H2: PRE -> TE	-0.117	1.307	0.191
H3: AUT -> TE	0.127	1.528	0.127
H4: EMO -> VIR	0.012	0.181	0.857
H5: PRE -> VIR	0.600	9.266	0.000
H6: AUT -> VIR	0.219	3.836	0.000
H7: VIR -> TE	0.303	3.323	0.000

The results of the path coefficient in Table 4. show that some of the hypotheses are rejected. Since this study uses two tail test, the benchmark score for the T-statistics is 1.96, and for P value is 0.05. In order to be accepted, the T-statistics score is above the benchmark score, and the P value score is below the benchmark score.

The first hypothesis is accepted because the T-statistics and P value are in accordance to the benchmark scores. It is confirmed that emotion (EMO) has a significant influence on travel experience (TE) with a positive correlation. The second and third hypotheses, however, are rejected because the values of T-statistics are below 1.96 and P values are above 0.05. So, presence (PRE) and authenticity (AUT) have no significant influence on travel experience (TE).

The fourth hypothesis is rejected because the score for T-statistics is below 1.96 and P values is above 0.05. It means that emotion (EMO) has no significant influence on travel experience (TE). The fifth and sixth hypotheses are accepted because the values of T-statistics are above 1.96, while P values are below 0.05. It means both presence and authenticity have significant influences on virtual reality usage (VIR) with a positive correlation. Finally, the last hypothesis is also accepted because the T-statistics and P value are in accordance to the benchmark scores. Therefore, virtual reality usage (VIR) has a significant influence on travel experience (TE) with a positive correlation, too.

Combining the data from the descriptive statistics and the path coefficient, it is interesting to study traveling behavior during the Covid-19 pandemic. Traveling for leisure has become a necessity for people living in urban areas because those people are trapped in the work and life routine. Occasionally, they need a break from the routine to refresh and recharge their body and soul. Referring back to the respondents of this study, the majority of the respondents is in the productive stage of their life, meaning they are actively studying, working, and building a new family. The respondents engage on leisure traveling at least twice a year before the pandemic. It is proven by their positive responses on traveling experience (TE), which is reflected in the mean of 4.007, which is relatively high. Therefore, the outbreak of the Covid-19 becomes a kind of imprisonment as they are limited to conduct outdoor activities.

Although the mean of virtual reality usage (VIR) is slightly below average or 3.466, virtual reality can substitute the urge to go out as it creates a kind of an imitated presence with the actual destination and enjoyment in using the virtual reality gadgets. However, the overall R-square of this study is relatively weak, so improvement to enhance traveling experience needs to be explore. In the meantime, virtual reality plays its role as an intervening variable to mediate some independent variables, namely presence (PRE) and authenticity (AUT), and the dependent variable. It is interesting to observe that presence and authenticity are not influencing respondents' experience while traveling, yet they become significant through the use of virtual reality.

4 CONCLUSION

As social medias and related technologies are advancing into virtual reality, the influence of virtual reality on tourism experience is positive and significant, although the influence is relatively weak. Besides, tourism experience is also influenced by emotion. Apparently, presence and authenticity are not directly influencing tourism experience anymore, as they are replaced by virtual reality. Presence and authenticity, however, have positive significant influences on virtual reality. Finally, emotion does not influence virtual reality. It means the virtual reality still cannot replicate the emotion of tourists who travels to enjoy their vacation. Therefore, virtual reality is still in the stage of infancy in replacing the real tourism experience. To conclude this study, virtual reality still cannot replace the real tourist experience, because tourist experience is affected by many other complex factors that need to be replicated into a virtual reality.

This study has some limitations, especially in the data collection and respondents. The data were collected during the Covid-19 pandemic, which may impose some biases, as people were not allowed to travel for vacation so they had to contain their desire to travel. The respondents were locked up inside their residences so they explored the world through their social medias, which created some distortions on expectations and experiences. The respondents of this study also cannot reach wider samples as they were invited through social medias. For future research, it is noticeable that virtual reality has some influences on the real tourism experience, so it is necessary to explore the other factors that affect tourism experiences, which can be incorporated into the features of tourism virtual reality experiences.

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