The Marketing Effects of Virtual Reality Experiences on promoting tourism destination

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Introduction

Consumers are always changing and accepting of new types of technology. Many researchers have investigated the role of information in influencing travel decisions (Bieger & Laesser, 2004). Due to the intangible characteristics of tourism, tourism suppliers rely heavily on using visuals, photos, or imagery to promote destinations (MacKay & Smith, 2006; Aziz & Zainol, 2011). As technology advances, tourism marketers are developing innovative ways to use visual representation to promote a positive destination image and increase visitation in an increasingly complex and competitive global marketplace (Baker & Cameron, 2008; Echtner & Ritchie, 1991). Some scholars have found that consumers are becoming more resistant towards traditional visual media as sources of information (Fransen, Verlegh, Kirmani, & Smit, 2015) as Virtual Reality (VR) becomes more widely accessible (Ulrich, 2015). VR is already having significant impacts on many industries, including the tourism industry. The use of VR in promoting tourism is a growing topic of interest among industry practitioners, academics, and tourism related associations, etc. Through VR, users can have interactive experiences with virtual environments that expands the users’ imagination (Rebelo, Noriega, Duarte, & Soares, 2012). Lee and Oh (2007) found that web technology has enabled many hotels to offer Virtual Reality (VR) tours that provide a complete picture of the hotel, and this type of VR tour can help travelers decrease their anxiety and become more familiar with unknown destinations. VR can provide users/tourists certain experiences and activities within a destination. It is critical for tourism marketers to be more informed on this technology. VR has great potential for destination promotion, because VR can provide immersive sensations immediately and can allow individuals to have a better understanding of an attraction or site. VR is also considered as a promotional tool that has the potential to reduce the perceived risk of purchasing intangible services or tourism-related products. VR can help tourists have more realistic expectations (Klein, 2003).

Although some studies have found the effectiveness of VR tools on promotion activities, there is still a need for more evidence to confirm that VR is more persuasive than the existing traditional methods to promote tourism-related products (Fransen, Verlegh, Kirmani & Smit, 2015). Guttentag (2010) suggested that VR tourism research requires more continuous investigation because VR technology is developing rapidly and the younger generation may prove far more receptive than their predecessors to these technologies. Moreover, Guttentag (2010) even suggested future topics could be related to the effectiveness of using VR to market tourism destinations to different demographic segments based on gender, age, or nationality. Therefore, the research goal is to investigate the effect of VR communication tools in enhancing marketing advertising effect, destination tourism image, and flow experience (flow and interactivity) compared to two other tools: YouTube video and traveling magazine, and then examine the moderating effect of the acceptance of new technology on the relationship between tourism marketing effects and different
communication tools.

**Literature Review**

Virtual Reality and other interactive technologies can be considered as marketing promotion tools which can encourage tourists to visit an attraction (Fauzi & Gozali, 2015; Tussyadiah, Wang & Jia, 2016). VR can be used to plan and manage a destination (Cheong, 1995; Prideaux, 2002; Sussmann & Vanhegan, 2000). Williams and Hobson (1995) stated that, “From a marketing perspective, VR has the potential to revolutionize the promotion and selling of tourism” (p.425).

**Advertisement effects.** Advertisements can evoke consumption visions that inspire potential consumers to imagine themselves using or experiencing the product or service being promoted (Walters, Sparks & Herington, 2007). Because tourism goods and products are not tangible and cannot be used or tested in advance, consumers must make decisions according to the information provided by travel agencies, friends or relatives, travel books, social media, or official tourism websites, etc. The information they collect will affect how they make travel decisions as well as their expectations for their travel experience (Cheong, 1995; Hobson & Williams, 1995). Some scholars have said that internet marketing is important for the tourism industry and is responsible for providing visual and descriptive information (Buhalis & Law, 2008; Doolin, Burgess, & Cooper, 2002; Gratzer et al., 2004). Compared to the old advertisement tools, VR can not only provide visual and descriptive information to the users but also provide opportunities for the users to have interactive experiences with the virtual environment. Again, VR’s tourism marketing potential lies primarily in its ability to provide extensive sensory information to prospective tourists. Therefore, this study proposed the following hypothesis: *For destination marketing, Virtual Reality can create better marketing effects compared to other advertisement tools.*

**Tourism Image.** Individuals will have an image of a destination even without visiting it (Echtner & Ritchie, 2003), because people are exposed to variety of information. That information can affect the cognitive evaluation of a destination (Baloglu & McCleary, 1999; Gartner, 1993). However certain external information could create a negative image of a destination and be less capable of changing the individual affective aspect of an image towards a destination (McCartney, Butler, & Bennett, 2008; Li, Pan, Zhang, & Smith, 2009). The cognitive image towards a destination can build up an individual’s familiarity with a destination and provide a feeling of comfort (Yang, Yuan, & Hu, 2009). The tourism sector has long relied on the use of visual imagery when promoting destinations to communicate experiences and emotions and influence consumers (Dann, 1996; Mackay & Smith, 2006; Aziz & Zainol, 2011); however, people are becoming more resistant to traditional visual communication mediums as primary sources of information (Fransen et al., 2015). It is likely that immersive experiences offered through VR or other advertisement tools could offer enhanced communication of an intangible experience to potential visitors and positively impact the affective and conative destination image. Based on the above, this study proposed the following research hypothesis: *Virtual Reality tools can cause individuals to have a more positive tourism image towards the destination.*
**Flow experience.** According to Hoffman and Novak (1996), the reach of flow experience is decided by the two elements of interactivity and telepresence. Interactive technologies have considerably transformed the way consumers engage in shopping and brand activities (Hoffman & Novak, 1996; Yadav & Pavlou, 2014). Due to the popularity of social media through mobile phone and smartphone applications, B2C and C2C interactions have become more engaged with immersive Virtual Reality (Nah et al., 2011). Since the majority of tourism products are intangible, VR could be a great channel to provide information about destinations to tourists (Dann, 1996; Mackay & Smith, 2006; Aziz & Zainol, 2011). Virtual Reality could help tracking a user’s movements and reactions to the virtual environment of the destinations being marketed, which could later be used for the design of tourist destination in the real world. Webster, Trevino, and Ryan (1993) indicated that feeling flow is a subject and short-term experience during the time of being exposing to computer-mediated information, and that this feeling will cause users to want to continue engaging in messaging and gathering information. Hoffman and Novak (1996) also indicated that better interactivity and telepresence experiences will affect individuals' purchasing behavior. Korzaan (2003) found that the flow experience from communicating with computer-mediated information can directly affect individuals’ attitudes towards and products and also directly increase their purchase intentions. Therefore, this study proposed the following hypothesis: *Virtual Reality tools can cause individuals to have higher level of flow experience.*

**Acceptance of new technology.** According to consumer behavior literature, the usage of information technology has direct relationships among the perceived usefulness, perceived ease of use, and behavioral intentions (Childers, Carr, Peck & Carson, 2001). The acceptance of new technology can be described using Technology Readiness Levels (TRL), which is a method of estimating the technology maturity of the Critical Technology Elements (CTE) of a program during the acquisition process. Parasuraman (2000) thought that technology readiness is a psychological status in which individuals must complete the goals of life and career. Parasuraman (2000) concluded that individuals who are more optimistic and creative have a better and more open-minded attitude towards new technology, while people who are more insecure and have safety concerns will hold a more negative attitude towards new technology. Therefore, individuals’ attitudes towards new technology could influence how advertising types affect individuals’ attitudes towards destinations, tourism images, and flow experience. Based on the above, this study developed the fourth study hypothesis: *For destination marketing, the effect of advertisement methods on advertisement effects, tourism image and flow experience will be moderated by the users’ acceptance of new technology.*

**Methodology**

This study recruited 324 study participants, 22% of whom were male and 78% were female. The study participants were assigned into three groups, in which 86 participants were assigned to view a VR advertisement, 139 participants watched a YouTube video, and 99 participants were assigned to read a travel magazine. The information for all three groups was acquired from tourism destinations of Brazil. The 324 study participants were all students from Ming Chuan University, Taiwan, and were scheduled to participate in this study at a Leisure VR Lab from October 2018 to January 2019.
For the VR group, they viewed a 360-degree video regarding Brazil tourism destinations (three minutes 45 seconds) using Oculus Rift, a VR head-mounted display (HMD). For the 2D Video group, the study used a video introducing Brazil. For third group, they need to read an article about traveling in Brazil from a E-version magazine and they spent around 15 minutes to read the story. After reading this, the participants filled out a survey. The survey included questions about advertisement effects, tourism image, travel intentions, flow experience, acceptance of new technology, and personal background.

**Advertisement effects.** The advertisement effects included attitudes towards the advertisement contents and attitudes towards the tourism destination. The items used in this study came from a series of scales from Walters et al., (2007) that asked about the quality of mental images that came to mind and the ability to view oneself at the destination. Ten questions were designed, all of which referred to Brazil. The questions were measured using a seven-point Likert scale, with answers ranging from “very disagree” to “very agree”. This study also evaluated the participants’ intention to travel to Brazil.

**Flow experience.** According to Hoffman and Novak (1996), the reach of flow experience would be decided by two elements: Interactivity and Telepresence. Interactivity is achieved when users are provided with immediate feedback through their perceptions that a mediated environment has been modified based on their input (Klein, 2003). According to the four dimensions of interactive communication, equality of participants, message control, and mutual understanding, ten items were measured using a seven-point Likert scale. Telepresence is a sense of “being there” in an environment by means of a communication medium (Reeves and Nass, 1996; Steuer, 1992). Banos et.al. (2000) used three factors to measure telepresence: reality judgement, internal/external correspondence, and attention/abortion. This study selected ten items and measured them using a seven-point Likert Scale.

**Acceptance of new technology.** Another way to define acceptance of new technology is “The technology readiness”. Majority of studies used 36 item scale that were designed and recommended by Parasuraman & Colby (2001). For my study, only ten items were selected and redesigned to measure how much they can accept new technology by using a seven-point Likert scale, with answers ranging from 1 (strongly disagree) to 7 (strongly agree). The questions were created based on different dimensions (optimism, insecurity, innovation, and discomfort).

**Results**

Of the 324 study participants, 53% had experienced Virtual Reality before (such as VR game plans) and another 47% had no previous experience with VR. However, only 16% of the study participants had watched a tourism-theme Virtual Reality video. This meant that the majority of the study participants were not familiar with VR gear and videos and could therefore be randomly assigned to experience a VR video. Since the study used Brazil as the promoted destination, study participants who had visited Brazil were excluded from the study. The 324 study participants were divided into two groups based on the score from the ten items measuring their acceptance to new technology. Of the participants, 47% were considered as individuals who were able to accept the
usage of new technology and liked to learn how to use new technology while the other 53% were less likely to learn new technology and would have difficulties using new technology.

Factor analysis was used to extract the main factors for the 18 flow items. According to the scores rated by the study participants, 18 items were categorized into four factors. All of the factors had eigenvalues greater than one and explained 67% of the total variance. The first factor was named as “friendliness” and included nine items with 28% variance. The second factor was “telepresence” and included three items with 14% variance. The third factor, “interactivity”, included three items with 14% variance. The last factor was “realness” and included three items explaining 11% of variance.

**Difference on advertisement effects, tourism image and flow experience by marketing tools**

The first study hypothesis examined how different marketing tools affected the study participant’s evaluation of the advertisement effects, tourism image, and four flow factors. According to six one-way ANOVA analyses, the tourists who were assigned to watch different marketing tools (Virtual Reality, YouTube, and magazine) expressed significant differences in their evaluations towards advertisement effects, tourism image, and the four flow factors. According to the Post Hoc analysis, the study participants who were assigned to experience Brazil tourism VR videos had a higher positive attitude toward Brazil advertisements compared to the other two groups who were assigned to read a Brazil travel magazine and a Brazil YouTube tourism video. The same results also occurred for another four dependent variables, including Brazil tourism image, flow factor-friendliness, and flow factor-interactivity. This meant that the study participants who watch a Brazil VR video expressed a higher connection to the Brazil advertisement, had better feelings about Brazil, and also thought that the Brazil VR video was friendly, easy to use. It was easy to focus on the VR experience and feel interactive in the VR environment.

Table 1. Mean difference of five variables by different promotion tools*

<table>
<thead>
<tr>
<th></th>
<th>F value</th>
<th>Sig</th>
<th>comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertisement effects</td>
<td>8.669</td>
<td>0.000</td>
<td>VR&gt;Magazine; VR&gt;YouTube</td>
</tr>
<tr>
<td>Tourism image</td>
<td>11.455</td>
<td>0.000</td>
<td>VR&gt;Magazine; VR&gt;YouTube</td>
</tr>
<tr>
<td>Flow factor-Friendliness</td>
<td>8.943</td>
<td>0.000</td>
<td>VR&gt;Magazine; VR&gt;YouTube</td>
</tr>
<tr>
<td>Flow factor-Telepresence</td>
<td>17.934</td>
<td>0.000</td>
<td>VR&gt;YouTube, Magazine&gt;YouTube</td>
</tr>
<tr>
<td>Factor factor-Interactivity</td>
<td>22.733</td>
<td>0.000</td>
<td>VR&gt;Magazine; VR&gt;YouTube</td>
</tr>
<tr>
<td>Factor factor-Realness</td>
<td>3.317</td>
<td>0.038</td>
<td></td>
</tr>
</tbody>
</table>

*The bigger the mean is, the more positive the attitudes towards those variables.

Furthermore, a T test was used to examine whether significant differences in advertisement effects, tourism image, and the four flow factors existed between the study participants who could accept new technology and those who could not. A significant difference existed in the results for the
advertisement effects, tourism image, friendliness, interactivity, and realness factors, except for the Telepresence flow factor. The results indicated that the study participants who could accept new technology also expressed a higher level of its advertisement effects, tourism image, friendliness, interactivity, and realness factors. The results of the T-test are expressed in Table 2.

Table 2. Mean difference of five variables by their acceptance of new technology

<table>
<thead>
<tr>
<th>Variable</th>
<th>T value</th>
<th>Sig</th>
<th>comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertisement effects</td>
<td>3.449</td>
<td>0.001</td>
<td>High Acceptance&gt;Low Acceptance</td>
</tr>
<tr>
<td>Tourism image</td>
<td>2.970</td>
<td>0.003</td>
<td>High Acceptance&gt;Low Acceptance</td>
</tr>
<tr>
<td>Flow factor-Friendliness</td>
<td>3.047</td>
<td>0.003</td>
<td>High Acceptance&gt;Low Acceptance</td>
</tr>
<tr>
<td>Flow factor-Telepresence</td>
<td>0.685</td>
<td>0.494</td>
<td></td>
</tr>
<tr>
<td>Factor factor-Interactivity</td>
<td>2.170</td>
<td>0.031</td>
<td>High Acceptance&gt;Low Acceptance</td>
</tr>
<tr>
<td>Factor factor-Realness</td>
<td>2.906</td>
<td>0.004</td>
<td>High Acceptance&gt;Low Acceptance</td>
</tr>
</tbody>
</table>

*The bigger the mean is; the more positive attitudes they have towards those variables.

**Examination of the moderating effect-acceptance of new technology**

Two-way ANOVA was used to evaluate study hypothesis four: *For destination marketing, the effect of advertisement methods on marketing effects (advertisement effects and tourism image) and flow experience will be moderated by the users’ acceptance of new technology.* The six dependent variables were advertisement effect, tourism image, and the four factors from flow experience. The independent variable was type of marketing tool: VR, YouTube, and magazines. The moderating variable was the acceptance of new technology. In total, six two-way ANOVA analyses were conducted for the hypothesis and the results are shown in Table 3 and Fig. 1-3. As shown in Table 3, the Two-way ANOVA test revealed significant interaction between type of marketing tool and acceptance of new technology with respect to tourism image (F value=3.861, p=0.024), flow-friendly experience (F value=3.454, p=0.035), and flow-interactivity experience (F value=3.688, p=0.026). The simple main effect after Two-way ANOVA was also conducted and the result is shown in Table 4.

Figure 1 shows that acceptance of new technology moderated how different types of marketing tools affected the level of tourism image evaluated by the study participants. For the study participants who were likely to accept new technology, those who viewed the tourism information through Virtual Reality showed a higher level of tourism image towards Brazil compared to the other two groups. However, for the study participants who were less likely to accept the usage of new technology, the result was different. The study participants who were assigned to read a travel magazine developed the highest level of tourism image towards Brazil compared to the VR and YouTube group. Through the simple main effect result shown in table 4, a significant difference in
how marketing tools affect tourism image existed between the two groups. For the individuals who liked to try new technology, different types of marketing tools influenced the level of tourism images, but for the individuals who were less likely to accept new technology, marketing tools did not affect the tourism image evaluation.

Figure 2 shows that the acceptance of new technology moderated how different types of marketing tools affected the level of the flow-friendless factor rated by the study participants. Then simple main effect was analyzed and the result is shown in Table 4. It was found that a significant difference in how marketing tools affected the level of the flow-friendless factor existed between the two groups. For the individuals who were able to accept new technology, different types of marketing tools influenced the level of the tourism images. The study participants who experienced Brazil VR felt that VR was a friendly source that could be used to collect travel information compared to the group who watched a Brazil YouTube video. For the individuals who were less likely to accept new technology, marketing tools did not affect their evaluations on the flow friendless factor.

Figure 3 shows that the acceptance of new technology moderated how different types of marketing tools affected the level of flow-interactivity factor rated by the study participants. The simple main effect was analyzed and the result is shown in Table 4. It was found that a significant difference in how marketing tools affect the level of the flow-interactivity factor existed between the two groups. For the individuals who were able to accept new technology, different types of marketing tools influenced the level of the tourism images. The study participants who experienced Brazil VR felt that VR could provide them with the opportunity to have interactive action with virtual tourism destinations compared to the other two types of marketing tools. For the magazine and YouTube video, the study participants were information receivers only and could not have any interaction with the information provider. For the individuals who were less likely to accept new technology, marketing tools did not affect their evaluations on the flow interactivity factor.

Table 3. Interaction effects of type of media and travel goods on different variables

<table>
<thead>
<tr>
<th>Interaction effects</th>
<th>M.S.</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tourism image by media type*new technology acceptance</td>
<td>2.409</td>
<td>3.861</td>
<td>0.024</td>
</tr>
<tr>
<td>Flow-Friendless by media type*new technology acceptance</td>
<td>2.206</td>
<td>3.454</td>
<td>0.035</td>
</tr>
<tr>
<td>Flow-Interactivity by media type*new technology acceptance</td>
<td>3.058</td>
<td>3.688</td>
<td>0.026</td>
</tr>
</tbody>
</table>
Table 4. Simple main effect after Two Way ANOVA

<table>
<thead>
<tr>
<th></th>
<th>High acceptance of new Tech.</th>
<th>Low acceptance of new Tech.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$F$</td>
<td>Sig</td>
</tr>
<tr>
<td>Tourism image</td>
<td>4.390</td>
<td>0.018</td>
</tr>
<tr>
<td>Flow-Friendless</td>
<td>6.539</td>
<td>0.003</td>
</tr>
<tr>
<td>Flow-Interactivity</td>
<td>6.181</td>
<td>0.004</td>
</tr>
</tbody>
</table>

Conclusion and Discussion

Technology innovations such as the Internet, social media, and mobile apps have transformed the structure of the tourism industry (Cjalkiti & Sigala, 2008; Kim, Lee & Law, 2008) and affected how tourism destinations are perceived and consumed (Sigala, 2005; Buhalis & Zoge, 2007; Govers, Go & Kumar, 2007). Guttentag (2010) mentioned that Virtual Reality (VR) offers tourism many useful applications that deserve greater attention from tourism researchers and professionals because VR’s applications and implications for the tourism sector are vast and significant. These applications include planning and management, marketing, entertainment, education, and accessibility. Cabello et al. (2011) carefully suggested that a well-designed virtual world that can satisfy this on-demand need and a Virtual Reality tool should be easily accessible, navigable, and well-structured from the perspectives of the users. In other words, if users do not consider VR to be a friendly and accessible tool to collect travel information, individuals might be more comfortable with using other tools to search for travel information.

Like the majority of previous studies, this study also found that VR can be a wonderful marketing tool for tourism destinations compared to YouTube, Facebook, or magazines, etc. The study participants who were assigned to experience a VR video all showed a higher level of advertisement effects, had a better evaluation of tourism destination image, and had a higher level of flow experience. However, the results of Two-way ANOVA showed that the effects were moderated by whether the individuals could accept new technology. For individuals who like to try new technology, Virtual Reality could be useful and beneficial for marketing tourist destinations. However, individuals who are afraid of trying new technology will still prefer using the old ways to collect
travel information. Why can some individuals accept new technology while others cannot? Parasuraman (2000) concluded that individuals who are more optimistic and creative will have a better and more open-minded attitude towards new technology, while people who are more insecure or have safety concerns will hold a more negative attitude towards new technology. In summary, individuals’ attitudes towards new technology influence how advertising types affect attitudes towards destinations, tourism image, and flow experience.

References


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