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# Effects of Immersive Experiences in Green Tourism on Behavioral Intentions of Young Tourists

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**Abstract:** Green tourism is a growing industry with large development potential. Thus, it is necessary to explore how immersive experiences drive its development in an innovative form of tourism. In this study, the behavioral intentions (BI) of young tourists were investigated by a technology acceptance model (TAM). Meizhou, a city with abundant green tourism resources, was chosen as the study area to formulate a BI model for immersive experiences in green tourism. The hypotheses were proposed and tested based on the results of a questionnaire survey and statistical analysis. The results revealed that tourists' perceived usefulness (PU) and attitude toward using (ATU) significantly affected their BI. PU played a mediating role between perceived ease of use (PEOU) and BI. Appropriate recommendations regarding the development of immersive experiences in green tourism in Meizhou were made to enrich the BI model's application. The research results provide an important reference for urban governance.

**Keywords:** Green tourism; Immersive experience; Technology acceptance model (TAM); Tourism industry

## 1. Introduction

In consumption, people pursue cost-effective products. Driven by the use of new technologies such as artificial intelligence (AI), 5th Generation Mobile Communication Technology (5G), augmented reality (AR), and virtual reality (VR), the development of high-quality and immersive experiences has been accelerated. With the transformation and upgrading of the tourism industry, experiential tourism with immersive experiences has attracted much attention. Based on the effective protection and rational use of natural environments, green tourism allows tourists to appreciate the beauty of nature, improves their understanding and awareness of environmental protection, and promotes balanced regional development.

Located in the northeastern mountainous areas of Guangdong Province, Meizhou is the so-called "Capital of Hakka Culture" and is known also for its "Red Culture". The city has the advantages of developing green tourism and great potential in exploiting rural tourism. Local governments also attach great importance to innovations in the contents and forms of the tourism industry in Meizhou. Meizhou was chosen as the study area in this research owing to its abundant green tourism resources as well as its disadvantages such as insufficient cultural exploration, immature tourism business models, and difficulty in attracting young tourists. By determining tourists' perceptions and demands of Meizhou, we explored how to combine the development of local green tourism resources with immersive experiences. A questionnaire survey was conducted to determine the differences in tourists' perceptions of the development status of tourism, as well as the applications of green and immersive tourism in Meizhou. The respondents were young people with a higher tendency to choose green tourism and a higher acceptance of immersive experiences. The analysis of their perceptions and BI was conducted to propose how to develop green immersive tourism. The research topics were summarized as follows: (1) young tourists' perceptions of green immersive tourism, (2) young tourists' attitudes toward green immersive tourism in Meizhou, and (3) the development path of green immersive tourism in Meizhou.

## 2 Materials and Methods

### 2.1. Theoretical Basis

2.1.1. Immersive Experience and Green Tourism

The concept of immersive experience was proposed first in 1975. Essentially being beneficial and pleasant, it characterizes complete involvement in daily activities. Perception is a key prerequisite element and self-efficacy is an important factor in the generation of immersive experience, [1,2]. Immersive experience is the enjoyment of sheer pleasure [3]. When consumers have immersive experiences, they feel joy and pleasure, which produces more positive value perceptions toward activities [4]. In ordinary tourism consumption, numerous disposable consumer goods are supplied but they cause serious soil and water pollution [5]. For this reason, tourism enterprises need to focus on the demand for sustainable development [6,7]. In the overall trend of sustainable development, companies in the tourism industry have enormous challenges in environmental transformation required by the government, economy, culture, and society. These challenges, however, also give great opportunities for the tourism industry.

### 2.1.2. Technology Acceptance Model (TAM)

TAM was first proposed by Davis [8,9]. Fig. 1 illustrates TAM which has been validated and adjusted by scholars. TAM is widely applied in management, psychology, and education [10]. The model includes two key variables, perceived usefulness (PU) and perceived ease of use (PEOU). The use behavior of an individual is determined by BI, which is, in turn, decided by attitude toward using (ATU) and PU. More specifically, ATU depends on PU and PEOU, which are, in turn, affected by external variables, which also indirectly affect ATU via PU [11]. The model has been applied in tourism to explore how the use of smartphone apps by foreign travelers was related to PU, PEOU, ATU, BI, and behavior (B) [12]. Studies have also been conducted on the model concerning smart tourism and BI [13,14].
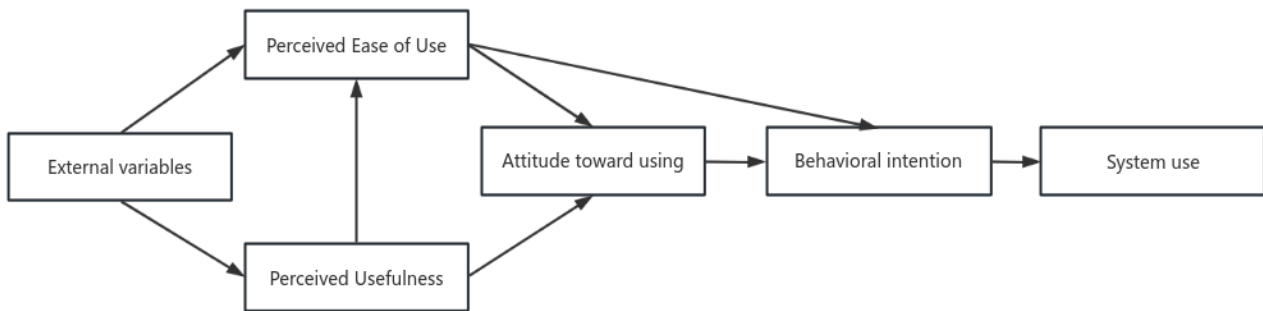


**Fig. 1.** Illustration of TAM.

(1) PEOU refers to the degree of ease of use of a specific system [15]. In tourism, it is defined as the degree of convenience experienced by a person engaged in immersive tourism. Lehto found that previous tourism experiences of a place affected the intentions of tourists to revisit it [16].

(2) PU refers to the degree to which the use of a specific system improves a person's work performance [15], i.e., the system's degree of usefulness. Moon and Kim combined perceived entertainment as an intrinsic motivational factor with TAM and confirmed that perceived entertainment positively affected ATU [17]. In this research, PU referred to the effect and degree of entertainment produced by a green immersive tourism system.

(3) ATU refers to an individual's subjective positive or negative feelings when using a system. These feelings are usually manifested as acceptance or rejection of the results of using technology at work [18]. Kaushik et al. used an extended TAM to predict tourists' attitudes toward offline self-service technology in hotels and found that the effects of the user's trust and satisfaction on BI were positively correlated [19]. In this research, ATU referred to a tourist's trust in and satisfaction with a tourism system.

(4) BI refers to the subjective probability that predicts an individual's exhibition of a specific behavior. A stronger BI indicates a higher probability. For example, after learning about a tourism destination from short videos, a tourist is more likely to manifest a specific BI, such as the willingness to travel, recommend, and revisit that location [20]. BI also determines a person's behaviors and attitudes toward using a certain technology. In this research, BI referred to the willingness of a tourist to engage in an immersive tourism experience.

## 2.2. Research Hypotheses

### (1) PEOU and BI

Tourism experiences are a tourist's overall impression that is perceivable or cognizable in a situation in which different levels of perception and cognition such as pleasure or comfort are made [21]. Jeon found that the information quantity, design effect, and interactivity of a destination marketing organization's website positively affected a user's immersive experience [22]. With the application of immersive technology, consumers can have tourism information about Meizhou more rapidly and comprehensively and obtain convenient and interesting tourism experiences. The levels of a tourist's perception and cognition of tourism in Meizhou affect their tourism behaviors. To determine how PEOU affected BI, we proposed Hypothesis H1.

H1: The PEOU of immersive experiences in green tourism has a positive effect on BI.

### (2) PEOU and PU

Shiau proposed that PEOU positively affected PU and users' willingness to use it [23]. The degree of convenience in gaining cognition and understanding of the development status of tourism affects the perceptions of green immersive tourism and the degree of entertainment in the city. To determine how PEOU affected PU, we proposed Hypothesis H2.

H2: The PEOU of immersive experiences in green tourism has a positive effect on PU.

### (3) PU and BI

Baker and Crompton proposed that value perception affected tourism experiences significantly [24]. Goldman found that accessibility, infrastructure, local culture, safety, uniqueness, and other factors of tourist destinations significantly affected tourism experiences [25]. Relying on innovative technology and cultural connotations, immersive experience offers visitors a better taste of tourism, allows them to experience culture, relax their bodies and minds, and enhance their tourism experiences. The higher the satisfaction of the tourists, the stronger their willingness to consume is. To determine how PU affected BI, we proposed Hypothesis H3.

H3: The PU of immersive experiences in green tourism has a positive effect on BI.

### (4) PEOU, PU, and BI

Jordan et al. showed that factors such as PU, PEOU, and service quality affected online teaching platforms and increased the willingness of learners to continue using the platforms with PU having a mediating role [26]. PU and PEOU have significant effects on use behaviors [27,28]. By improving tourists' degrees of understanding of tourism, PU and PEOU offer more relevant information, thereby enhancing tourists' experiences of green immersive tourism and ultimately affecting their BI. To determine PU's relationships to PEOU and BI, we proposed Hypothesis H4.

H4: The PU of immersive experiences in green tourism plays a mediating role between PEOU and BI.

### (5) ATU and BI

Chen [29] stated that factors affecting satisfaction indirectly affected the willingness to continue to use the satisfaction produced by tourism experiences and tourists' willingness to recommend or revisit destinations. They also provided timely feedback while improving satisfaction [30,31]. The experiences increased a stronger willingness to consume. To determine how tourists' attitudes affected their BI, we proposed Hypothesis H5.

H5: Attitudes toward immersive experiences in green tourism have positive effects on BI.

## 2.3. Research Framework

We formulated a BI model based on TAM. In the model, PEOU and ATU were independent variables, PU was the mediating variable between PEOU and perception, and BI was the dependent variable. The research framework consisted of five paths as shown in Fig. 2.
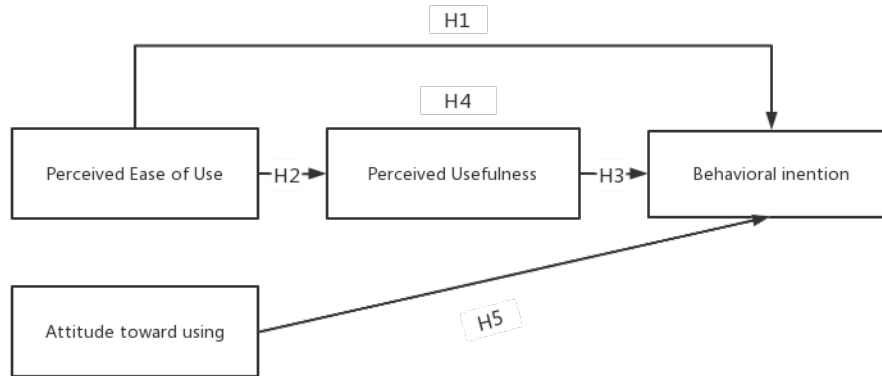
**Fig. 2.** BI model for development of immersive tourism in Meizhou.

*2.4. Questionnaire Design*

The questionnaire was created in two parts: Part 1 was created to elicit the respondents' basic personal information and tourism activities while Part 2 was to analyze the differences in tourists' perceptions of immersive tourism and their BI in Meizhou. The questions in this part were intended to characterize four variables, each of which belonged to different dimensions. Ultimately, a total of 27 measurement items were included as shown in Table 1.

**Table 1.** Questionnaire design and scale basis.

| Variable Type | Dimension | Summary of Operational Definition | Reference |
|---|---|---|---|
| Independent variable | PEOU | Degree of tourists' understanding of immersive tourism Degree of convenience perceived by tourists in immersive tourism | [13] |
| | PU | Tourists' beliefs that immersive tourism is rewarding and brings about better entertainment | [13,17] |
| | ATU | Recommended orientations for and satisfaction with immersive tourism | [13,29] |
| Dependent variable | BI | Willingness of tourists to experience immersive tourism in Meizhou | [13,32] |

PEOU: perceived ease of use; PU: perceived usefulness; ATU: attitude toward using; BI: behavioral intention.

*2.5. Respondents*

Young tourists aged between 16 and 45 years (following the definition of young people given by the United Nations Educational, Scientific, and Cultural Organization (UNESCO)) were included in this research. Questionnaires were distributed via "Questionnaire Star" (WJX.cn), an online survey platform. A total of 387 questionnaires were sent out, and 376 valid responses were recovered with an effective recovery rate of 97.15%.

**3. Results and Discussions**

*3.1. Descriptive Statistics*

Female respondents account for 67% while males accounted for 33% of total respondents. Those with undergraduate degrees accounted for 93.9%, followed by those with secondary school diplomas ( 4%) and those with postgraduate degrees (1.9%). 87.5% were tourists from the outside of Meizhou. The respondents who had not visited Meizhou accounted for 54.3% while those who visited accounted for 45.7%. Those who had no tourism-related working experience accounted for 84%. Those traveling once or twice a year accounted for 58%, followed by those who did not travel before accounted for 10.1% while those who traveled three times or more in a year accounted for 10.1%.

*3.2. Reliability*

The internal consistency of the responses was validated with an overall Cronbach's α coefficient of 0.883, which was higher than 0.7.

*3.3 Difference Analysis*

(1)    Differences in identity (residents or tourists)

There was a significant difference in the PEOU of the residents and tourists ($t(374) = 2.250$, $p = 0.025$, $d = −0.351$). The PEOU of the residents (M = 3.07, SD = 0.57) was higher than that of the tourists (M = 2.90, SD = 0.50). There were differences in PU ($t(374) = 2.181$, $p = 0.030$, $d = −0.340$). The PU of the residents (M = 3.84, SD = 0.58) was higher than that of the tourists (M = 3.61, SD = 0.67). ATU was also different ($t(68.982) = 2.203$, $p = 0.031$, $d = −0.288$) as the ATU of the residents (M = 3.79, SD = 0.51) was higher than that of the tourists (M = 3.61, SD = 0.64). However, there was no significant difference in BI.

(2)    Differences in tourism experiences

There was a significant difference in the PU of the respondents who had visited Meizhou and those who had not ($t(374) = 2.277$, $p = 0.023$, $d = −0.340$). The PU of the respondents who had visited Meizhou (M = 3.72, SD = 0.64) was higher than that of those who had not (M = 3.57, SD = 0.67). There was a difference in ATU ($t(371.159) = 2.205$, $p = 0.044$, $d = −0.208$). The ATU of the respondents who had visited Meizhou (M = 3.71, SD = 0.60) was higher than that of those who had not (M = 3.58, SD = 0.65). BI also had a difference ($t(373.591) = 2.873$, $p = 0.004$, $d = −0.294$). The BI of the respondents who had visited Meizhou (M = 3.69, SD = 0.64) was higher than that of those who had not (M = 3.49, SD = 0.73). However, there are no significant differences in PEOU.

(3)    Differences in tourism-related working experience

There was a significant difference in the PEOU of the respondents with tourism-related working experience and those without such experience ($t(374) = 3.486$, $p = 0.001$, d = −0.491). The PEOU of the respondents with tourism-related working experience (M = 2.96, SD = 0.54) was higher than that of those without such experience (M = 2.89, SD = 0.48). PU also showed a difference ($t(374) = 3.721$, $p = 0.000$, $d = −0.524$). The PU of the respondents with tourism-related working experience (M = 3.93, SD = 0.61) was higher than that of those without such experience (M = 3.59, SD = 0.66). The ATU of the respondents with tourism-related working experience (M = 3.80, SD = 0.53) was higher than that of those without such experience (M = 3.60, SD = 0.64), which showed a significant difference ($t(95.457) = 2.619$, $p = 0.010$, $d = −0.322$). However, there was no significant difference in BI.

(4)    Differences in educational level

There was a significant difference in the PEOU of respondents with different academic qualifications ($F(2372) = 6.343$, $p = 0.002$, $\eta p = 0.033$). According to Scheffe, there was no significant difference ($p = 0.997$) between those with secondary school diplomas (M = 3.64, SD = 0.58) and those with undergraduate degrees (M = 3.63, SD = 0.66). The PEOU of those with postgraduate degrees (4.51, 0.46) was significantly higher than that of those with secondary school diplomas ($p = 0.10$) and those with undergraduate degrees. ATU did not show a difference ($F(2372) = 3.793$, $p = 0.023$, $\eta p = 0.020$). According to Scheffe, there was no significant difference ($p = 0.872$) between those with secondary school diplomas (M = 3.54, SD = 0.49) and those with undergraduate degrees (M = 3.62, SD = 0.63). The ATU of those with postgraduate degrees (4.27, 0.54) was significantly higher than those with secondary school diplomas ($p = 0.31$) and those with undergraduate degrees ($p = 0.02$). There was no significant difference in the BI or PU of respondents with different academic qualifications.

(5)    Differences in travel frequency

There were no significant differences in PEOU, BI, or ATU of the respondents with different travel frequencies but there were significant differences in PU: $F(2373) = 4.608$, $p = 0.011$, $\eta p = 0.024$. According to Scheffe, there was no significant difference ($p = 0.106$) between those who did not travel (M = 3.52, SD = 0.59) and those who traveled once or twice a year (M = 3.67, SD = 0.69). The PU of those traveling three times or more in a year (M = 3.87, SD = 0.61) was significantly higher than that of those who did not travel. There was no significant difference ($p = 0.195$) between those who traveled once or twice a year and those who traveled three times or more in a year.

*3.4. Correlation and Linear regression Analysis*

The results of the Pearson's correlation analysis are given in Table 2.

<div style="text-align:center">**Table 2.** Pearson's correlation analysis.</div>

| | PEOU | PU | ATU | BI |
|---|---|---|---|---|
| PEOU | 1 | | | |
| PU | 0.491** | 1 | | |
| ATU | 0.467** | 0.891** | 1 | |
| BI | 0.467** | 0.891** | 1.000** | 1 |

PEOU, PU [$r(376) = 0.49$, $p < 0.01$], ATU [$r(376) = 0.47$, $p < 0.01$], and BI [$r(376) = 0.47$, $p < 0.01$] are positively correlated; PU, ATU [$r(376) = 0.89$, $p < 0.01$], and BI [$r(376) = 0.89$, $p < 0.01$] are positively correlated; ATU and BI [$r(376) = 1$, $p < 0.01$] are positively correlated.

The relationship between PEOU and PU was tested by regression analysis (Table 3). The variation inflation factor (VIF) of the test result was less than 10, so collinearity was excluded. There was a significant relationship between PEOU and PU ($\beta = 0.490$, $p \leq 0.001$). The higher the PEOU score, the better the PU performance.

<div style="text-align:center">**Table 3.** Linear regressions of PU and PEOU.</div>

| | PU | | |
|---|---|---|---|
| | B | SE B | β |
| PEOU | 0.635 | 0.058 | 0.0490 |
| $R^2$ | 0.240 | | |
| Adjusted $R^2$ | 0.238 | | |
| F | 118.23*** | | |
| df | (1374) | | |

Note: $N = 376$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The relationship between PU and BI was tested by regression analysis (Table 4). VIF was 1.000, so collinearity was excluded. There was a significant relationship between PU and BI ($\beta = 0.763$, $p \leq 0.001$). The higher the PU score, the better the BI performance.

<div style="text-align:center">**Table 4.** Linear regressions of PU and BI.</div>

| | BI | | |
|---|---|---|---|
| | B | SE B | β |
| PEOU | 0.723 | 0.032 | 0.763 |
| $R^2$ | 0.582 | | |
| Adjusted $R^2$ | 0.581 | | |
| F | 520.912*** | | |
| df | (1374) | | |

Note: $N = 376$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The relationship between ATU and BI was tested, and the result is shown in Table 5. VIF was 1.000, so collinearity was excluded. A significant relationship between ATU and BI was observed ($\beta = 0.816$, $p \leq 0.00$). The higher the ATU score, the better the BI performance.

<div style="text-align:center">**Table 5.** Linear regressions of ATU and BI.</div>

| | BI | | |
|---|---|---|---|
| | B | SE B | β |
| PEOU | 0.736 | 0.27 | 0.816 |
| $R^2$ | 0.666 | | |
| Adjusted $R^2$ | 0.665 | | |
| F | 745.092*** | | |
| df | (3372) | | |

Note: N = 376; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 6 shows the integrated results of Tables 3–5.

**Table 6.** Regression paths of PEOU, PU, ATU, and BI.

| Dependent Variable DV | Model Independent Variable IV | Non-Standardized Value Coefficient B | Standard Error SE B | Coefficient β | t | Significance | R2 |
|---|---|---|---|---|---|---|---|
| PU | (Variable) | 1.783 | 0.173 | | 10.279 | 0.000 | 0.240 |
| | PEOU | 0.635 | 0.058 | 0.490 | 10.873 | 0.000 | |
| BI | (Variable) | 1.056 | 0.115 | | 9.155 | 0.000 | 0.672 |
| | PU | 0.723 | 0.032 | 0.763 | 2.623 | 0.000 | |
| BI | (Variable) | 1.000 | 0.098 | | 10.175 | 0.000 | 0.666 |
| | ATU | 0.736 | 0.027 | 0.816 | 27.296 | 0.000 | |

Non-standardized coefficients, significance, standard errors, and standardized values were integrated into the research model to obtain the path coefficients as shown in Fig. 3.
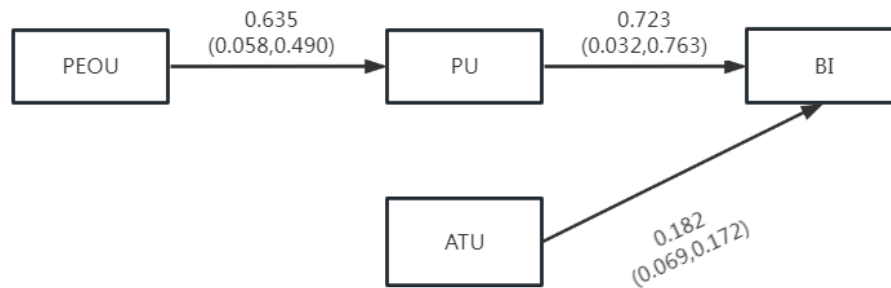


**Fig.3.** Path coefficients.

*3.5. Mediating Effect*

Regression analysis was performed to test the mediating effects of PU (M) on PEOU (X) and BI (Y) (Table 7). PEOU had significant explanatory power for PU ($\beta = 0.49$, $p < 0.001$) and BI ($\beta = 0.43$, $p < 0.001$). PU also had significant explanatory power for BI ($\beta = 0.73$, $p < 0.001$). However, when the explanatory power of PEOU for BI and that of PU for BI were considered simultaneously, the explanatory power of PEOU was not significant ($\beta = 0.073$, $p = 0.057$), whereas that of PU remained significant ($\beta = 0.73$, $p < 0.001$). Thus, the mediating effect was verified. PU partially mediated the relationship between PEOU and BI.

**Table 7.** Mediating effect.

| | PU M Model 1 | BI Y Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| PEOU | 0.49*** | 0.43*** | | 0.073 |
| PU | | | 0.77*** | 0.73*** |
| $R^2$ | 0.241 | 0.185 | 0.585 | 0.589 |
| Adjusted $R^2$ | 0.239 | 0.183 | 0.583 | 0.586 |
| F | 118.81*** | 85.14*** | 526.21*** | 266.78*** |
| DOF | (1374) | (1374) | (1374) | (2373) |

Note: N = 376; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

## 4. Discussion

The test results and findings are summarized in Table 8.The five hypotheses were supported by the BI model for immersive experiences in green tourism. This result proved the rationality of the model and explained the behaviors of young tourists. The correlation analysis result revealed that PEOU, PU, and ATU were positively correlated with BI, indicating these three dimensions affected the immersive experiences of young tourists. The regression analysis result showed that the PU and ATU of young tourists had significant effects on BI for immersive tourism experiences. Snigdha and Pallavi [27] and Chuang et al. [28] confirmed that PU and PEOU had significant effects on use behaviors, too. Chen validated the positive effects of ATU on BI and obtained positive β for PU and BI [29] and suggested that the PU and ATU of young tourists affected their immersive tourism experience to some extent. The higher the positive values of PU and ATU, the more BI. This observation was consistent with the research findings of prior studies. However, there was no significant relationship between PEOU and BI. This finding differed from the research findings in prior studies. This difference was attributed to the different consumption characteristics of young tourists who lacked understanding and experience of immersive tourism as a new form of tourism service. With the promotion of immersive tourism, the effects of young people's PEOU are expected to be enhanced. PU mediateedd PEOU and BI, and PEOU did not directly affect BI indirectly influenced young tourists' immersive tourism experiences via PU. This finding was consistent with previous findings. When young tourists had a higher PEOU for immersive tourism experiences in Meizhou, they also had a higher PU for immersive tourism in Meizhou and a higher BI for visiting Meizhou. Tourism enterprises and local governments need to enhance young tourists' degree of understanding of Meizhou's immersive tourism industry by increasing publicity and awareness and their PEOU and PU for immersive tourism which ultimately affect BI for visiting Meizhou.

**Table 8.** Research findings.

| No. | Research Hypothesis | Result |
|---|---|---|
| H1 | The PEOU of immersive experiences in green tourism has a positive effect on BI. | Not supported |
| H2 | The PEOU of immersive experiences in green tourism has a positive effect on PU. | Supported |
| H3 | The PU of immersive experiences in green tourism has a positive effect on BI. | Supported |
| H4 | The PU of immersive experiences in green tourism plays a mediating role between PEOU and BI. | Supported |
| H5 | Attitudes toward immersive experiences in green tourism have positive effects on BI. | Supported |

## 5 Conclusions and Recommendations

By investigating the factors influencing young tourists' decisions for immersive tourism in Meizhou, the shortcomings of prior studies were supplemented by the current research results using TAM. We formulated and validated a BI model for immersive experiences in green tourism using TAM. Tourists' PU and ATU had significant positive effects on their BI. PU plays a mediating role between PEOU and BI. 5.2 Recommendations

Tourism resources are a special type of intangible asset that is assessed in a multi-disciplinary approach (economics, history, geography, and culture) concerning artistic appreciation, cultural history, scientific research, and entertainment and leisure value. Conditions in various dimensions are assessed for their ability to meet the requirements for investments in immersive experience facilities. For the basic operations of scenic spots, investments are required for immersive tourism. Comparisons need to be made with traditional tourism for tourists' feelings, market feedback, and business income. Driven by innovative technology, the integration of tourism and modern technology can be promoted to enhance tourism experiences. New-generation immersive experiential tourism products using 5G, ultra-high definition, virtual reality, and AI must be developed. The unique culture of Meizhou needs to be explored in depth to strengthen its cultural identity and integrate diverse methods through abundant integration channels, content, and technology. Efforts must also be made to increase publicity and urists' understanding of the immersive experiences of green tourism and meet their entertainment and tourism demands. Then, local influence can be expanded to enhance positive attitudes toward immersive tourism in Meizhou. Modern tourism emphasizes diverse sensory experiences, as well as creates scenarios and atmospheres to enhance tourism experiences through content innovation and technical support. Innovation must be continuously endeavored to upgrade content and technology and provide tourists with immersive experiences in green tourism. Such experiences enhance the sense of cultural gain and pleasure, thus ultimately promoting the development of the tourism industry.

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