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RESEARCH ON AESTHETIC COGNITION, FLOW EXPERIENCE AND TECHNOLOGY ACCEPTANCE IN VIRTUAL CULTURAL ACTIVITIES

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Abstract

This research delves into integrating aesthetic experience and technology acceptance within virtual cultural activities, with the primary goal of enhancing user engagement. To achieve this, the study employs a meticulously structured questionnaire to assess participants' aesthetic cognition, flow experience, and acceptance of technology. The methodology involves comprehensive data collection from participants engaged in various virtual cultural events, followed by detailed analytical comparisons to understand user preferences and behaviors. The results clearly indicate a strong preference for immersive and user-friendly technological interfaces. This preference underscores the critical role of aesthetic cognition in determining the success of cultural activities. Furthermore, the findings suggest that significant improvements in interactive features could dramatically enhance user participation and engagement in virtual

cultural environments, thereby enriching the overall experience and effectiveness of these activities.

Keywords:
Aesthetic Cognition, Flow Experience, Technology Acceptance, Virtual Cultural Activities

1. Introduction

From the perspective of experience, the general public's enthusiasm for design, aesthetics, tactility, and experiential activities has formed a new lifestyle in recent years. This has led many related industries to start focusing on experiential design and the aesthetics economy. Traditional marketing, focusing only on product functionality, can no longer satisfy consumer needs. Consumers have realized that fulfillment at the spiritual level is also very important, and thus, "experiential marketing," which values the context of consumption, is thriving (Schmitt, 1999). However, while offline physical experiential activities are becoming increasingly prosperous, with the trend of new technologies in the digital age, online experiential activities have also become popular. Online immersive experiences refer to when individuals are wholly absorbed in an activity, fully relaxing due to their interest, concentrating their attention on a particular thing, and experiencing a psychological phenomenon of "immersion." Immersive experiences have four characteristics: control over personal experience, focused attention, curiosity, and intrinsic interest. Once users enter a state of immersion, it can enhance communication effects and quality and reduce communication barriers (Trevino & Webste, 1992). Therefore, virtual cultural activities can be the best venues for creating new experiences. This research explores how to adapt to the times while maintaining the essence of cultural activities. The virtual cultural activities referred to in this study are virtual activities derived from physical activities. They can either enhance the original physical activities or allow people to participate virtually online when they cannot attend the physical activities, satisfying their spiritual needs.

2. Literature Review

2.1. Aesthetic Cognition

Aesthetic is used for "cognition by the senses" or "sensory cognition," signifying the recognition through the senses, that is, the sensory experiences. Sensory aesthetics refers to the pleasurable sensations people experience in an environment through sight, hearing, smell, touch,

and taste. After the most basic sensory aesthetics, people's pursuit of beauty has evolved accordingly. For instance, formal aesthetics focuses on how people appreciate the beauty of forms and shapes. It emphasizes the appreciation of the form or structure of things, and the resulting sense of beauty and pleasure is one of the important reference indicators for designers during the design phase. Symbolic aesthetics focuses on the meanings associated with appreciation, emphasizing the associative meanings given by the influence of the environment and the process of deriving pleasure from it. For example, the color red symbolizes good fortune, which is why Taiwanese people like to use red in their New Year and other festive decorations (Nasar, 1988; Liu & Huang, 2014; Chen & Liu, 2016).

2.2. Flow Experience

Csikszentmihalyi (2000) proposed the concept of flow experience, suggesting that when individuals engage in activities, they concentrate their attention and become fully immersed in the situation, filtering out all irrelevant perceptions. This state of complete immersion is referred to as "flow" and is considered an optimal state of enjoyment and experience. "Flow" is closely associated with the creation of meaning, ultimately leading to a unified flow experience. Immersive experiences are related to positive emotions and result from the interaction between an individual's mindset and activities. They can profoundly influence people's subjective sense of well-being (Diener & Emmons, 1984; Gwinner, Gremler, & Bitner, 1998).

The process of human experience encompasses the overall experience, sensory perceptions, emotions, broader social and cultural context, and immediate usage scenarios. These processes enable consumers to understand their feelings and emotions and add attractiveness to products or services. They can evoke positive emotions in people, making products or services more enjoyable. Therefore, discussing the "aesthetics" from a design perspective has become the most critical factor for these design professionals. Representing aesthetically pleasing products or services is the most direct and effective way to captivate consumers (Tiger, 1992; Green & Jordan, 2002; Norman, 2003; Hassenzahl, 2004; McCarthy & Wright, 2004; Lin & Wang, 2008; Kang, Lin, Wang, & Lin, 2008).

2.3. Technology Acceptance

Davis [16] proposed the Technology Acceptance Model (TAM), which was developed based on the Theory of Reasoned Action (TRA), to explore the relationship between rational and

emotional factors and the use of technology. The Technology Acceptance Model is used to explain or predict the impact of external factors on users' internal feelings, attitudes, and intentions when using digital technology tools. The TAM model includes five main dimensions: Perceived Usefulness (PU), Perceived Ease of Use (PEU), Attitude toward Computer Use (ATCU), Intention to Use (ITU), and Usage (Hung, Liang, & Chang, 2005). The model has two main belief variables: Perceived Usefulness, which refers to the helpfulness for job performance and future performance; and Perceived Ease of Use, which is the degree of ease of use (Hsia, 2010; Yu, Yu, & Yu, 2011). Based on the above discussion, Barnett (1990) found that cognitive enjoyment is the degree of pleasure one feels when participating in an activity or adopting a system. Later, Barua and Whinston (1996) also pointed out that cognitive enjoyment can improve the efficiency of people's activities, meaning that the higher the fun felt during an activity, the easier it is to increase an individual's perceived usefulness. Moon and Kim (2001) noted that perceived enjoyment is an intrinsic belief or motivation shaped by the environment and the individual's subjective experience of using the Internet. They also pointed out that when people use a new system if they have higher interest, they will be willing to spend more time using that system, and such a positive perception also boosts perceived usefulness.

3. Research Methods

The rise of the age of sensibility has made the study of aesthetics a pressing need for the general public during this era. The momentum has been set for developing an innovative industry that merges cultural uniqueness with design; the market for cultural industries fostering the aesthetic economy, experiential economy, and emotional consumption has matured. This market is worth investing in resources and is transitioning to an industry with high added value (Council for Cultural Affairs, 2009). Emotional design can spark consumers' emotions, leading to emotional responses such as happiness, annoyance, excitement, or depression. Emotions are part of the experiential process of products and services, including the overall experience, senses, emotions, broad social and cultural context, and immediate usage scenarios (McCarthy & Wright, 2004; Ho & Siu, 2012). Through related theoretical research, it is evident that the journey from aesthetic cognition to flow experience and then to technology acceptance is an inside-out process. It begins with the senses, feeling the external environment and the intervention of digital technology, and then integrating oneself into the experience process. This study merges relevant theories, starting

from aesthetic cognition and blending it with the audience's information decoding process. It encompasses the uptake of sensory aesthetics, the recognition of formal aesthetics, and the emotional impact of symbolic aesthetics. This is also where human-centered design patterns meet immersive experiences, moving from 'people' to 'objects (technology, services)' to 'work behavior (immersion).' Using human senses to experience technology and services through immersive behavior, one can appreciate the process of adding cultural, technological, and emotional value to activities. Due to the mixed reality feature, there is also an in-depth exploration and analysis of perceived usefulness and perceived ease of use to perceived enjoyment within the technology acceptance model.

3.1. Research Case Introduction

This research consists of four case studies, all originating from Taiwan. These include two apps, "Lotung Treasure Hunt Adventure" and "Jinsha Township Expedition: In Search of the Wind Lion Gods," as well as two websites, "Tachia Matsu Pilgrimage Procession" and "DAXIDAXI Pray for Blessings."

- **Case 1**: "Lotung Treasure Hunt Adventure" is a location-based puzzle-solving game app that allows users to explore Luodong with a lazy-themed itinerary. The content primarily focuses on Luodong temples, historical culture, tourist attractions, and local cuisine. Participants can enjoy solving puzzles while wandering through the hidden corners and alleys of Luodong town. Groups of friends or families can team up to tackle challenges together, and upon successful completion, they can even receive limited-edition souvenirs!
- **Case 2**: "Jinsha Township Expedition: In Search of the Wind Lion Gods" utilizes the latest mobile AR (Augmented Reality) technology, guiding visitors to explore each Wind Lion God statue in Jinsha Town and sparking the Lion-Searching craze. The app game includes text, images, and sound and enables real-world and image interaction. It even features hidden Q-version Wind Lion Gods, allowing visitors to join in, strike creative poses, and share their experiences on social media platforms such as Facebook, Instagram, and more!
- **Case 3**: "Dajia Mazu Pilgrimage Procession" is the official website for the Dajia Mazu Pilgrimage, providing information and services related to the event. The site features updates, event notices, pilgrimage schedules, and registration for activities, among other practical resources. Additionally, contact information is available for participants or those

interested in the event to obtain more details. The website aims to serve as a comprehensive information platform for the Dajia Mazu faith and cultural activities.

- **Case 4**: "DAXIDAXI Pray for Blessings" is the official website celebrating Daxi's culture and festivities. It emphasizes integrating contemporary design with traditional folk beliefs through urban festivals. The site spotlights the annual homage to Guan Sheng Di Jun, unveiling a sequence of activities culminating in the traditional festivity. Highlighting aspects like community, temples, and design, it aspires to forge a modern carnival that promotes cultural exchange, understanding, and inclusivity.

3.2. Questionnaire Design

This study conducted an initial investigation to explore potential consumers' perceptions of virtual cultural activities, focusing on aesthetic cognition, flow experience, technology acceptance, and willingness to participate.

This study developed research tools through a literature review and incorporated an informed consent button in the online questionnaire. It identified three dimensions of aesthetic cognition: sensory, formal, and symbolic aesthetics, with three questions for each dimension. Flow experience was analyzed through two dimensions: Senses and technology, with nine questions for Senses and six for technology. Technology acceptance was examined through perceived usefulness, perceived ease of use, and perceived enjoyment, with four, four, and three questions, respectively, in addition to three questions on the willingness to participate.

4. Research Results and Discussion

After excluding invalid questionnaires, this study collected a total of 87 questionnaires.

4.1. Reliability and Validity of the Questionnaire

Table 4.1 summarizes the results of the reliability and validity analyses. Tests were conducted across various dimensions, including aesthetic cognition, flow experience, technology acceptance, and the overall scale. The findings indicated significant inter-rater reliability (0.8; $p < 0.001$), which meets the standard criteria. After removing items E1 and E2 from the scale, the overall factor increased to meet the standard value. These overall results demonstrate the research tool's feasibility. In the final questionnaire, only question E3 and question E4 were retained.

Table 4.1: *The Questionnaire Reliability and Validity (N=87)*

Dimension		Code	Cronbach α	Factor
Aesthetic Cognition	Sensory Aesthetics	Sa1	0.659	0.908
		Sa2		0.888
		Sa3		0.567
	Formal Aesthetics	F1	0.809	0.864
		F2		0.829
		F3		0.865
	Symbolic Aesthetics	Sy1	0.785	0.815
		Sy2		0.785
		Sy3		0.905
Flow Experience	Senses	S1	0.826	0.522
		S2		0.729
		S3		0.527
		S4		0.720
		S5		0.679
		S6		0.533
		S7		0.693
		S8		0.795
		S9		0.702
	Science And Technology	T1	0.868	0.756
		T2		0.817
		T3		0.824
		T4		0.777
		T5		0.754
		T6		0.725
Technology Acceptance	perceived usefulness	U1	0.853	0.809
		U2		0.876
		U3		0.835

		U4		0.813
	perceived ease of use	E3	*0.34* > 0.690	*0.742* > 0.874
		E4		*0.589* > 0.874
		En1		0.863
		En2		0.851
	perceived enjoyment	En3	0.783	0.790
		0.841		0.790
		0.841		0.790
Willingness to Participate		P1	0.841	0.893
		P2		0.890

Source: Self/Authors' Own Illustration

4.2. The Average of the Dimensions of the Questionnaire

4.2.1. Average Comparison of Each Questionnaire Dimension

Comparing the averages across all dimensions of the survey, it can be noted that most scores are above 5, as shown in Table 4.2. However, the technological aspect of flow experience and the ease of use in technology acceptance score relatively lower on average, suggesting that the technological component of these four virtual activities could be enhanced. It implies a need for a more seamless integration into the event interfaces, particularly for first-time users. Aesthetic cognition has the highest average score among all dimensions, with symbolic aesthetics scoring the highest within this category, indicating that cultural activities have their advantages, especially in terms of cultural significance. In the technology acceptance model, ease of use scores the lowest across the entire survey, but enjoyment scores are high, indicating that the design of the activities has successfully attracted users.

Table 4.2: *Average Comparison of Dimensions (N=87)*

Dimension	**AVG**	**Dimension**	**AVG**
Aesthetic Cognition	**5.40**	**Flow Experience**	**5.01**
Sensory Aesthetics	5.19	Senses	5.12
Formal Aesthetics	5.29	Science And Technology	4.89
Symbolic Aesthetics	5.71		

Dimension	**AVG**	**Dimension**	**AVG**
Technology Acceptance	**5.17**	**Willingness to Participate**	**5.21**
perceived usefulness	5.28		
perceived ease of use	4.45		
perceived enjoyment	5.43		

Source: Self/Authors' Own Illustration

4.2.2 Comparative Analysis of Survey Responses across Four Cases

In this study, 87 questionnaires were collected: 25 from Case 1, 21 from Case 2, 23 from Case 3, and 18 from Case 4. These figures are utilized to perform comparative analysis across the questionnaires' dimensions for the four distinct activities, as shown in Table 4.3.

The average comparisons were conducted for four activities across various dimensions. Case 3 scored the highest average in aesthetic cognition, flow experience, and technology acceptance compared to the other three activities. The willingness to participate showed no significant difference from Case 4. Despite this, the average scores across all dimensions did not vary significantly between the four activities. Case 3 generally performed better, suggesting that this event is more domestically and internationally renowned among the four cultural activities.

Table 4.3: *Comparison of averages for each case*

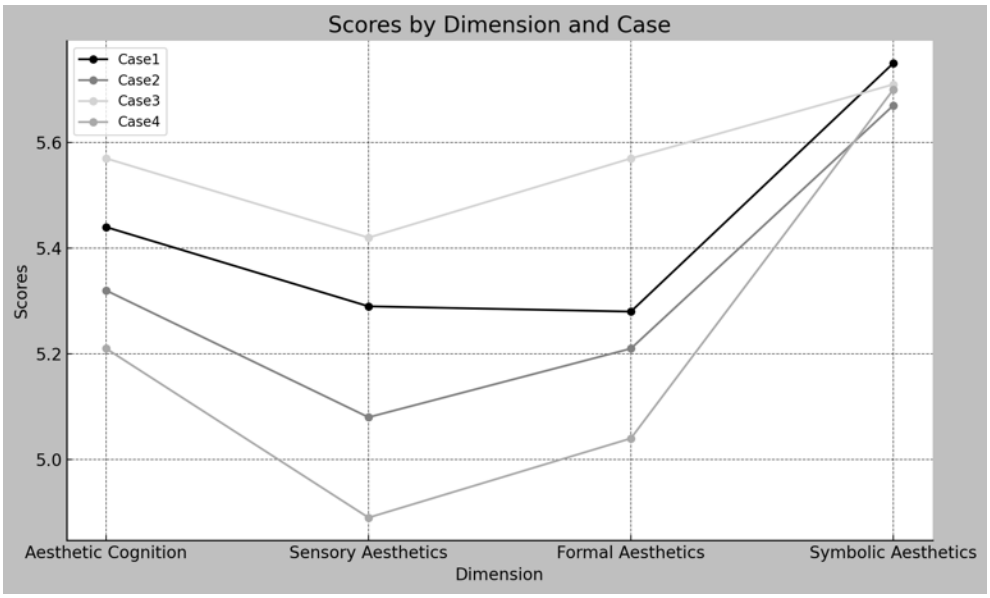
Dimension	**Case1**	**Case2**	**Case3**	**Case4**
Aesthetic Cognition	**5.44**	**5.32**	**5.57**	**5.21**
Sensory Aesthetics	5.29	5.08	5.42	4.89
Formal Aesthetics	5.28	5.21	5.57	5.04
Symbolic Aesthetics	5.75	5.67	5.71	5.70
Flow Experience	**5.06**	**5.03**	**5.13**	**4.75**
Senses	5.21	5.15	5.21	4.83
Science And Technology	4.91	4.90	5.05	4.67
Technology Acceptance	**5.16**	**5.09**	**5.3**	**5.1**
perceived usefulness	5.30	5.17	5.38	5.25
perceived ease of use	4.30	4.36	4.54	4.67
perceived enjoyment	5.48	5.38	5.57	5.22
Willingness to Participate	**5.07**	**5.21**	**5.29**	**5.30**

Source: Self/Authors' Own Illustration

4.2.2.1. Aesthetic Cognition

Figure 1 displays data from four different cases across three dimensions of aesthetic cognition (sensory aesthetics, formal aesthetics, and symbolic aesthetics). The chart reveals that the ratings for each dimension vary under different scenarios, with "symbolic aesthetics" consistently receiving higher scores across various situations.

Figure 1: *Dimensional Score Comparison across Cases of Aesthetic Cognition*

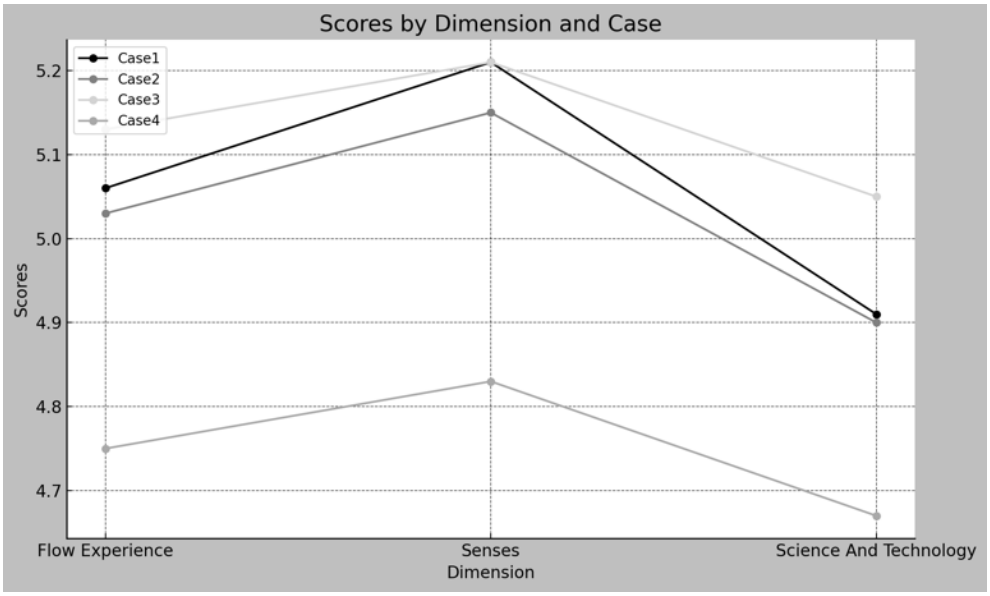


Source: Self/Authors' Own Illustration

4.2.2.2. Flow Experience

Figure 2 presents the ratings for four cases across two dimensions of flow experience (senses, science, and technology). It can be observed from the chart that the scores for each dimension differ under different circumstances, with "senses" generally receiving higher ratings in all scenarios.

Figure 2: *Dimensional score comparison across cases of flow experience*

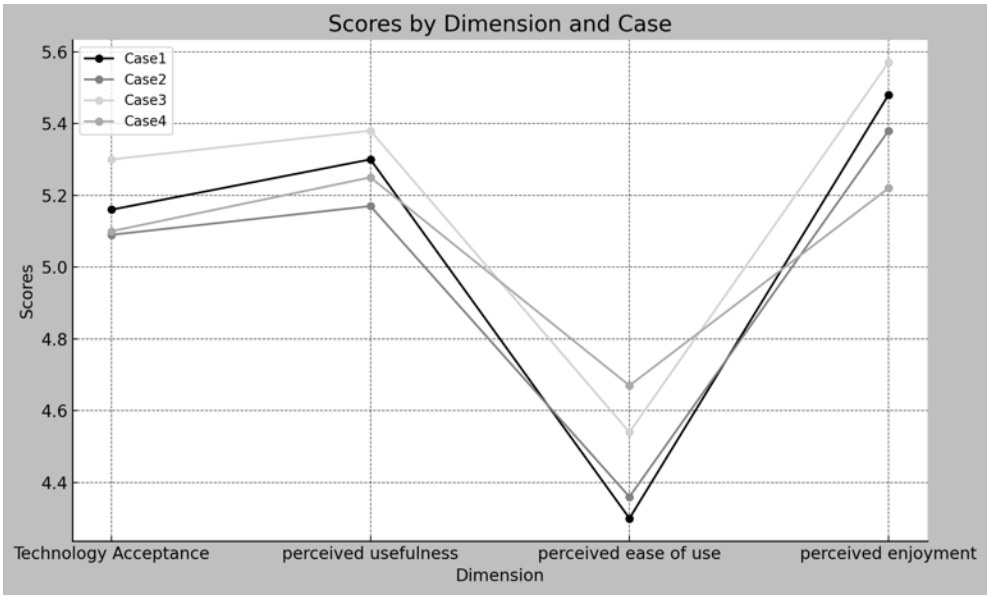


Source: Self/Authors' Own Illustration

4.2.2.3. Technology Acceptance

Figure 3 lists the ratings from four cases across three dimensions of technology acceptance (perceived usefulness, perceived ease of use, and perceived enjoyment). The chart indicates that the scores for each dimension vary with the scenario, with "perceived enjoyment" consistently scoring higher across different situations.

Figure 3: *Dimensional Score Comparison across Cases of Technology Acceptance*



Source: Self/Authors' Own Illustration

4.2.2.4. Willingness to Participate

The 'willingness to participate' dimension across four scenarios (case 1 to case 4) shows variation in scores. The chart reveals an upward trend in scores as the scenarios change. People prefer religious activities (case 1 and case 2) to local town activities (case 3 and case 4). In terms of platforms, compared to apps, people appear to have a stronger preference for web presentations.

4.3. Regression Analysis

A regression analysis was conducted to determine Willingness to Participate for aesthetic cognition, flow experience and technology acceptance. The dependent variable of Willingness to Participate reported an absolute value of -0.005 and a p-value of 0.995, which is greater than $\alpha = 0.05$. Thus, the null hypothesis was not rejected. The constant term was omitted from the regression equation given its potential to be valued at zero.

Among the three independent variables, the p-values for Flow Experience and Technology Acceptance were significant at 0.000 and 0.017, which is less than $\alpha = 0.001$ and $\alpha = 0.005$, thus rejecting the null hypothesis. This means that Willingness to Participate was positively related to Flow Experience and Technology Acceptance.

Aesthetic cognition reported p-values greater than $\alpha = 0.05$; thus, the null hypothesis was not rejected. This means that there was no significant linear relationship between aesthetic cognition and willingness to participate. Therefore, the coefficients for aesthetic cognition were excluded from the regression equation. Table 4 shows the results of the multiple regression analysis. The regression equation is as follows:

Willingness to Participate = 0.569 x (Flow Experience) + 0.347 x (Technology Acceptance)

The results also indicate that, regarding the willingness to participate, the two significant independent variables show that flow experience is more important than technology acceptance.

Table 4.4. *Regression Analysis (N=87)*

dependent variable	**independent variable**	**B**	**SE**	***β***	**t**
Willingness to Participate	Aesthetic Cognition	.112	.131	.099	.859
	Flow Experience	.569	.131	.485	4.354***
	Technology Acceptance	.347	.142	.225	2.483*
	R=.694 Rsq=.482 F=25.765***				

*p <.05 **P<.01 ***P<.001;

Source: Self/Authors' Own Illustration

5. Conclusion

This study synthesized insights from previous studies, broadened existing viewpoints, and derived findings by deploying questionnaires informed by historical research. The primary conclusions drawn from this investigation are summarized below.

- Following the refinement of the questionnaire through item deletion and ensuring all dimensions are fully addressed, the reliability and validity of the analysis results conform to established standards. Furthermore, this questionnaire is positioned to offer valuable design insights or serve as a benchmark for design practices within relevant industries.
- Upon comparing averages across various dimensions, it was found that symbolic aesthetics scored the highest among all dimensions, signifying that cultural activities have their advantages, especially in terms of cultural meaning. The high level of perceived enjoyment in the technology acceptance model indicates that people are interested in the design of the activities.
- A comparison of differences among the four activities revealed that case 3 generally performed better, suggesting that this activity may be the most renowned domestically and internationally among the four cultural activities.
- Regression analysis reveals a significant impact of flow experience and technology acceptance on individuals' willingness to engage. Therefore, it's advantageous to embed interactive experiences within virtual cultural activities, emphasizing sensory perceptions, emotional responses, and a more comprehensive array of socio-cultural meanings. Ensuring that interactive interfaces are user-friendly, straightforward, and entertaining is essential, as this can elevate enjoyment and encourage more frequent and prolonged use.

In summary, this study aims to provide helpful perspectives on enhancing the engagement and meaning of cultural experiences. It suggests the potential benefits of incorporating sensory and emotional components alongside technological aspects to deepen user engagement and participation.

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