

The Effects of Environmental Awareness, Value Perception and Emotional Experience on Malaysian Tourists' Willingness to Participate in Value Co-Creation

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ABSTRACT

Purpose: This study examines the factors affecting tourists' willingness to engage in value co-creation during dive tourism in Malaysia. **Theoretical framework:** This study adopted the theory of value co-creation. **Design/methodology/approach:** This study focuses on groups of tourists from various countries who engage in diving activities on Semporna Island, Redang Island, and Sipadan Island in Malaysia, with individuals participating in diving tourism as the unit of analysis. During the study, random sampling techniques were used to accurately select 384 tourists from the target tourist group as the research sample. First-hand data was obtained through a systematic data collection process, which was then used as the basis for subsequent in-depth analysis. **Findings:** There is a positive significant correlation between environmental awareness, value perception and emotional experience among divers visiting Malaysia and their willingness to participate in value co-creation. **Research, Practical & Social implications:** This result highlights the importance of enhancing tourists' environmental awareness, value perception, and emotional experience, which can provide effective policy recommendations for Malaysia's diving tourism.

Keywords: Theory of Value Co-Creation; Diving Tourism; Consumer Willingness to Participate.

INTRODUCTION

Tourism has been one of the fastest-growing industries worldwide in recent years. With its unique natural environment and leisurely atmosphere, island tourism has gradually evolved into an important destination for leisure travel, providing tourists with an ideal place to relax, get close to the ocean, and enjoy the sunshine (Jacob et al., 2024). Malaysia, as a typical tropical rainforest country, has unique geographical and policy advantages in developing tourism. Diving tourism is a major highlight of its tourism industry (Zakaria & Hua, 2024). Diving tourism is defined as tourism activities carried out by tourists who have received professional diving training and obtained the corresponding qualifications, wearing diving equipment following regulations, and diving into underwater or seabed areas (Cohen, 2024). Specifically, it includes underwater sightseeing, exploration of seabed ecosystems, and visits to seabed ruins (Tzanakis, 2024). Divers must hold a diving certificate or be accompanied by a professional diver with experience in diving when participating in diving activities (Ceniza et al., 2024). The diving tourism industry chain covers a wide range of areas, including diving skills training, boat rental, hotel accommodation arrangements, catering services, transportation, marine park tours, marine ecology protection, and

marine life conservation (Kinantasya & Pramono, 2024). Currently, Thailand, the Philippines, and Malaysia are performing exceptionally well in the development of recreational diving tourism in Asia. Not only do they have mature and comprehensive management systems, but they also rank among the top countries in terms of receiving international tourists. In particular, the three islands of Semporna, Redang Island, and Sabah in Malaysia have seen rapid growth in the recreational diving industry in recent years, receiving as many as 20,000 international tourists annually and becoming a popular destination for recreational diving tourism in Asia (Muhammad et al., 2024).

This study systematically reviews academic research on island diving tourism and divides it into three key periods based on the different characteristics of the discussion stages. The first period (1930-1960) was the foundation stage of diverse tourism research, which mainly focused on analyzing the development of diverse eco-tourism in various regions from the perspective of regional differences, with consumer value perception as the core influencing factor (Dai et al., 2024). At this stage, American academics are particularly concerned about the dual role of the ecological environment and consumer demand in the development of diving tourism (Giglio et al., 2020). The second period (1960-1997) witnessed the rapid development of research on diving tourism (Tzanakis, 2024). Researchers began to analyze in depth the diverse desires of consumers in tourism behaviour, and emotional experiences gradually rose to become a key influencing factor (Dimmock, 2009). Researchers not only conducted a detailed investigation of the factors influencing the development of the diving tourism industry, but also comprehensively examined issues such as types of diving tourism behaviour, ecological protection of tourist destinations, and biodiversity conservation, and conducted an in-depth analysis of the temporal effects brought about by changes over time (Loredo et al., 2019). The third period (1997 to present) saw divers further classified as eco-tourists (Yao, 2025). Against this backdrop, relevant theories gradually matured, and the concept of environmental protection became deeply ingrained in consumer awareness. Researchers have not only focused on the impact of diving tourism on local society, economy, culture, and other aspects, but also strengthened research on issues such as tourism resource development and utilization, and tourism destination planning (Gkarane & Vassiliadis, 2024). In particular, they have introduced concepts such as consumer preferences and value co-creation, forming a comprehensive theoretical framework (Omar Parvez et al., 2025; Yfantidou et al., 2024). A review of historical research literature shows that value co-creation in tourism mainly covers consumers' environmental awareness, value recognition, and emotional recognition, while consumers' willingness to participate is intertwined with and influenced by these cognitive factors.

Judging from the current tourism development trend in Malaysia, island diving has become a signature feature of its island eco-tourism (Kuba et al., 2024). However, in the process of developing and utilizing tourism resources, a series of issues have gradually emerged, especially the negative impact of tourism project construction on the local ecological environment (Guo & Li, 2024). Because of this, it is necessary to explore in depth how to effectively reduce the impact of tourism development on the ecological environment in the process of island tourism development, especially eco-tourism construction. This research not only has significant practical guidance significance but also provides valuable reference experience for the sustainable development of the diving tourism industry. This study constructs a model for evaluating consumers' subjective willingness to participate, with environmental awareness, value perception, and emotional experience as the core research content based on the core elements of consumer value co-creation theory, aiming to broaden the utilization of diving tourism resources. Based on existing academic literature, this study puts forward a series of research perspectives with theoretical value, to provide useful references for subsequent academic analysis and thematic discussions, thereby attracting more scholars to engage in research on island diving tourism and promoting the continuous improvement of theoretical research in this field. Ultimately, this study hopes to inspire tourist attractions to actively optimize diving tourism services through theory-guided practice, ensuring that island diving tourism achieves efficient use of Malaysia's resources and rapid economic development while effectively protecting the ecological environment.

RESEARCH MODELS AND HYPOTHESES

Research Models

Based on previous research findings, the researchers conducted field investigations of famous island diving sites in Malaysia (Yusoh et al., 2023). As we all know, Malaysia has a tropical rainforest climate, and the best time for divers is from early February to late October each year (Zhang et al., 2016). Therefore, this study divided the visit into three targeted periods. The first phase will take place from March to June 2024, during which researchers will primarily conduct field research and visits to the islands of Semporna. The second phase will take place from July to September 2024. To avoid the peak summer vacation period, researchers will visit Semporna Island, Redang Island, and Sipadan Island on the east coast of the Malaysian peninsula to conduct field research. The third phase will take place from October to November 2024, during which researchers will conduct research in the area surrounding Sipadan Island in Sabah, Malaysia. Through comparative analysis of the consumption perceptions of

tourists on various islands and interviews with experts, this study provides a comprehensive summary of the current status of marine eco-tourism projects for divers in Malaysia. Since value co-creation is a dynamic process achieved jointly by consumers and businesses, in field research, businesses are important participants in value co-creation, while consumers constitute a core component of the research, and there is a significant correlation between consumers' willingness to participate and the effectiveness of value co-creation (Elsharnouby & Mahrous, 2015; Sadighha et al., 2024; Yen et al., 2020). At the same time, this study combines historical literature research and field survey results to divide consumer value co-creation into three dimensions: **Environmental Awareness (EA)** , **Value Perception (VP)** , and **Emotional Experience (EE)**.

The concept of the theory of value co-creation can be traced back to the 19th century when it first appeared in the economic research literature and was discussed to some extent (Saxena et al., 2024). Pine and Gilmore proposed the arrival of the experience economy in 1999 and pointed out that the cutting-edge way to create value lies in the construction of experiences (Scott et al., 2010). As the most representative experience industry, the key to the effectiveness of the theory of value co-creation in tourism lies in the active participation and in-depth interaction of tourists during the tour (John & Supramaniam, 2024). Although value co-creation is still considered a relatively new theory in the current academic field, it has attracted widespread attention in the field of international tourism management research (Samarasinghe et al., 2024). In contrast, domestic tourism scholars have paid relatively little attention to this theory. From the perspective of traditional economic markets, value creation is regarded as the exclusive domain of producers, while consumers are merely seen as consumers of value (da Silva & Cardoso, 2024). However, from the perspective of the theory of value co-creation, the role of consumers has undergone a fundamental change, transforming from mere consumers of value to leaders of consumption, while producers and consumers in the traditional sense have become co-creators of value (Humphreys & Grayson, 2008). This study mainly relies on the **theory of value co-creation** to construct a theoretical framework supporting the relationship between the dependent variable and the independent variable.

Based on the above analysis, this study uses value co-creation theory as its theoretical foundation, sets consumer participation in value co-creation as the independent variable in the study, and establishes consumer willingness to participate as the dependent variable. Specifically, the independent variables are subdivided into three core dimensions, namely environmental awareness, value perception, and emotional experience. Given the intrinsic correlation and mutual influence between the dependent and independent variables, this study constructs a corresponding hypothesis model to explore the complex relationships between the variables and their impact on consumer behaviour.

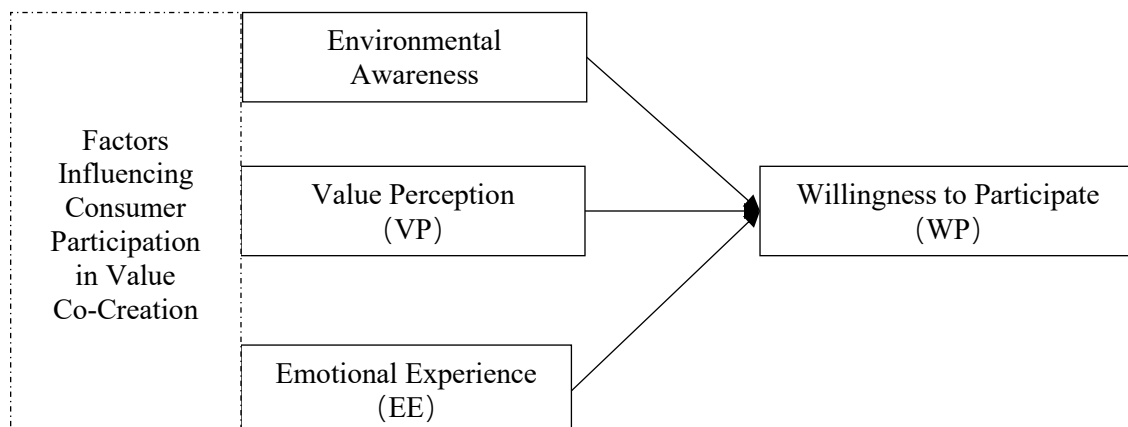


Figure 2.1 Research hypothesis model

Research Hypothesis

Through systematic sorting and analysis of historical documents, this study found that there is a certain correlation between the three independent variables (environmental awareness, value perception, and emotional experience) and the dependent variable (willingness to participate).

In a study on the relationship between environmental awareness and willingness to participate (Myung, 2018). The research found that the higher the tourists' evaluation of the sustainability of the tourism environment, the higher their overall evaluation of the tourist destination, which in turn enhanced tourists' environmental awareness and willingness to participate in value co-creation (Kusumawati & Utomo, 2020). Ji et al. research further pointed out that during the tourist travel process, there is a positive correlation between the willingness to purchase green products and environmental awareness, and that ethical self-identity plays a mediating role between consumer willingness and environmental protection (Ji et al., 2025). In a study on the relationship between value perception and willingness to participate, researchers found in a survey on rural tourism that there is a positive relationship between tourists' value perception and their willingness to participate (Chuangxin et al., 2024). In particular, value perception plays a significant role in promoting the development of tourism, especially in the process of meeting the diverse needs of tourists (Wang et al., 2025). In assessing tourism on Nusa Penida Island in Indonesia, Habibah et al. also found a positive relationship between tourist value and willingness to pay, highlighting the importance of tourists in sustainable tourism management (Habibah et al., 2025). In their study on the relationship between emotional experiences and willingness to participate, Nguyen and Duong pointed out that nostalgic emotional experiences have an important impact on sustainable tourism development, especially in stimulating tourists' willingness to participate (Nguyen & Duong, 2025). Shrestha and other scholars emphasize that in Indigenous tourism, tourists' emotional perceptions are an important supporting factor in promoting the development of Indigenous tourism (Shrestha et al., 2025). There is a positive correlation between tourists' authentic experiences and their willingness to participate, further highlighting the central role of tourists' autonomous willingness to travel and emotional perceptions in tourism research (White, 2005). It can be seen that, in summary, **there is a correlation between the factors influencing** tourists' participation in value co-creation and their willingness to participate. Based on this, the following hypotheses are proposed in this study.

H1: There is a positive significant impact between tourists' environmental awareness and their willingness to participate.

H2: There is a positive significant impact between tourists' value perception and their willingness to participate.

H3: There is a positive significant impact between tourists' emotional experiences and their willingness to participate.

RESEARCH METHODOLOGY

Scale Design

In the scale design stage, this study used variable indicators as key references and made adjustments to the relevant indicators based on the research content. The survey questionnaire consisted of multiple structured modules and used a quantitative scale adapted from a mature tool that had been verified in previous diving perception and tourism research (Dai et al., 2024; Lucrezi & Matiza, 2024; Muhammad et al., 2024). Based on the above design ideas, this study carefully constructed a scale suitable for this survey.

Given that this study focuses on popular diving islands in Malaysia, the research subjects were clearly defined as people involved in diving tourism in Malaysia. The scale mainly used the Likert scale (Likert, 1932). The questionnaire mainly used a Likert scale, with values from 1 to 5 corresponding to five different response options: "strongly disagree," "disagree," "neutral," "agree," and "strongly agree." In the end, this study successfully obtained valid questionnaires.

During the **preliminary research** phase, a total of 100 questionnaires were distributed. After rigorous screening to exclude questionnaires that did not meet the requirements, such as those with identical options or missing options, 94 valid questionnaires were obtained. Based on the collected questionnaire data, this study conducted systematic organization and analysis through project analysis (PA) and exploratory factor analysis (EFA), successfully identifying and removing items with factor loadings less than 0.5.

Table 3.1 Research Indicator Scale

Variable	Code	Indicator Content	Literature Sources
Environmental Awareness (EA)	EA-1	The importance of environmental protection during travel	(Suryawan et al., 2025)
	EA-2	The extent to which environmental quality affects the experience of tourists	(Elsamen et al., 2025)
	EA-3	The importance of environmental protection awareness for tourists themselves	(Ji et al., 2025)
Value Perception (VP)	VP-1	Facilities in tourist areas can meet the needs of tourists themselves	(Cheng et al., 2025)
	VP-2	The value of tourism services can make tourists feel happy.	(Caro-Carretero & Monroy-Rodríguez, 2025)
	VP-3	The degree to which the prices of tourism products and services in the area match tourists' perceptions of novelty and experience	(McKercher et al., 2025)
Emotional Experience (EE)	EE-1	Spending more money on tourism allows tourists to feel relaxed and happy	(Dai et al., 2024)
	EE-2	Tourist areas allow tourists to get close to nature and culture	(Schaffer & Kannis-Dymand, 2024)
	EE-3	Tourism projects that tourists find interesting or impressive	(De Salvo, 2024)
Willingness to Participate (WP)	WP-1	Tourists' willingness to return to a tourist destination	(Miocevic, 2025)
	WP-2	Tourists' willingness to recommend this place to their friends and family	(Omar Parvez et al., 2025)
	WP-3	Tourists' willingness to participate in interactive activities at tourist destinations	(Cohen, 2024)
	WP-4	Tourists' willingness to pay more for higher-quality services	(Al Ismaili et al., 2024)

(Source: Compiled by researchers based on historical documents)

This study adopts a **quantitative research** design paradigm, which has significant advantages in testing hypotheses and analyzing the internal relationships between multiple variables and is particularly suitable for rigorous analysis using numerical data (Bayley, 2013). The core objective of this study is to explore in depth the specific impact of environmental awareness, value perception, and emotional experience on tourists' willingness to participate. Quantitative methods have demonstrated unique efficacy in the field of consumer behaviour research (Stockemer et al., 2019). In such studies, key constructs such as cognition, perception, experience, and intention are precisely measured using standardized tools (Hair et al., 2021). This study is based on a philosophical stance of empiricism, placing great emphasis on the objectivity of research, the generality of conclusions, and the rigour of statistical testing.

Data Collection

This study uses structured questionnaire surveys as a data collection tool (Cheung, 2014). Structured questionnaire survey tool is widely accepted and applied in academia as a classic paradigm for large-scale quantitative research (Dunn et al., 2003; Phellas et al., 2011). The target audience of this study focuses on tourists from various countries who engage in diving activities on the islands of Semporna, Redang, and Sipadan. This group was selected as the research subject mainly because of its close connection with the development of diving tourism in Malaysia. As these tourists are deeply involved in local tourism activities, they can give objective evaluations of the local tourism environment and services based on their personal experiences. The questionnaire was distributed between February and October 2024 on three popular diving islands: Semporna, Redang, and Sipadan. Before conducting the survey, the research team obtained formal approval from the local tourism management department to ensure the compliance and legality of the study. The questionnaire was designed in three languages—Chinese, English, and Malay—to ensure that all respondents could clearly understand the content, thereby enhancing the inclusiveness and data quality of the study. To ensure the standardization and effectiveness of the questionnaire distribution and collection process, the research team specially engaged trained research assistants to assist in the relevant work, providing necessary guidance and minimizing response errors to the greatest extent possible.

This study employed **random sampling** techniques to ensure that every member of the target population had an equal opportunity to be selected (Olken & Rotem, 1995). This effectively enhanced the representativeness of the sample and significantly reduced the risk of selection bias (Cuddeback et al., 2004). According to the requirements of partial least squares structural equation modelling, for relatively simple models, a minimum sample size of 100 is usually sufficient to meet the analysis requirements (Wisz et al., 2008). For more complex models, 120 to 180 cases are required to produce robust estimation results. (S. Wang et al., 2024). A total of **400 questionnaires** were distributed in this study, and **384 valid questionnaires** were ultimately collected and used for subsequent analysis. This sample size significantly exceeded the recommended threshold (Giner-Sorolla et al., 2024; Wilks, 1941). Such a large sample size not only enhanced the statistical power of the study but also improved the general applicability and promotional value of the research results in a specific research context (Giner-Sorolla et al., 2024).

Data analysis was conducted using SmartPLS 4.0 software, a statistical tool specifically designed for partial least squares structural equation modelling. This software is suitable for exploratory models and effectively handles complex relationships involving mediating and moderating variables (Sarstedt et al., 2022). Therefore, it is an ideal choice for data analysis in this study. The data analysis process is divided into two stages and carried out in an orderly manner. First, the measurement model is comprehensively evaluated to verify the reliability and validity of the construct, ensuring data quality and research reliability (Cheung et al., 2024). Second, the structural model is analyzed in depth, using path coefficients, t-values, and significance levels obtained from bootstrapping analysis based on 5,000 samples to rigorously test the relationships between variables in the research hypothesis (Salleh et al., 2024).

This study strictly adheres to internationally recognized ethical research standards, fully complies with relevant international academic agreements, and has been successfully approved by the ethics review committee (Hamed et al., 2024). During the research process, the research team ensured that all participants voluntarily participated in the study after being fully informed. Specifically, the researchers explained the objectives and purpose of the study to the respondents in detail, solemnly promised to keep the respondents' information strictly confidential, and informed them that their answers would only be used for academic research purposes. To effectively protect the anonymity of the respondents, the study used an unidentifiable response collection method and encrypted all data. In addition, respondents have the right to withdraw from the study at any stage without incurring any adverse consequences. In terms of data processing and storage, the research team strictly complies with the General Data Protection Regulation (GDPR) (Blind et al., 2024) and the relevant provisions of China's Cybersecurity Law (Chen et al., 2025) to ensure that the legitimate rights and interests of participants and the security of their data are fully protected throughout the entire research cycle.

RESEARCH FINDINGS

Sample Analysis

This study conducted an in-depth analysis based on 384 valid survey questionnaires. Through a systematic analysis of four key dimensions, namely gender, age, nationality, and number of visits to this destination, a comprehensive and accurate outline of the characteristics of the survey population was drawn. The specific characteristics of the survey sample are presented below.

Table 4.1 Sample Characteristics Analysis

Features	Classification Items	Sample Size	Percentage
Gender	Male	233	60.7%
	Frauen	151	39.3%
Age	Less than 18 years old	25	6.5%
	19-30 years old	87	22.7%
	31-50 years old	198	51.6%
	More than 51years old	74	19.3%
Nationality	China	97	25.3%
	Singapur	87	22.7%
	India	64	16.7%
	Thailand	48	12.5%
	Indonesia	21	5.5%
	Malaysia	67	17.4%
Number of Divers	0-5times	193	50.3%
	6-10 times	94	24.5%
	11-15 times	59	15.4%
	More than 15 times	38	9.9%

(Data source: Data derived from sample analysis)

Among divers, gender differences are significant. The data shows that male divers account for a significantly higher proportion than female divers ($p < 0.05$), indicating that men have a stronger preference for diving tourism activities (Rahardja & Aini, 2025). This result may be related to men's tendency to be interested in high-risk sports and their perception of social roles (Wise & Ferraro, 2025), but further verification is needed in combination with variables such as cultural background and consumption capacity (Picard & Gaetz, 2025).

The age distribution of divers shows a double peak pattern: the 31-50 age group constitutes the core customer group, accounting for 51.0%, while the 19-30 age group accounts for 22.7%, forming a secondary peak. This age structure shows that the diving tourism market has two characteristics: people with medium to high spending power and young, experience-seeking visitors (Cater, 2010). It is recommended to develop differentiated products for different age groups, such as advanced skill courses for young and middle-aged people and family diving packages for middle-aged visitors (Albayrak et al., 2021).

In terms of nationality, Chinese divers accounted for 25.3% and Singaporean divers accounted for 22.7%, which was highly consistent with the overall structure of Malaysia's inbound tourist source countries ($r = 0.89$, $p < 0.01$). This correlation reveals that there is a significant homogenous effect between the distribution of source countries for diving tourists and traditional tourism markets in destinations, indicating that the development of the diving tourism market can rely on existing inbound tourism channels to integrate resources (Garrod, 2007).

The distribution of diving experience shows obvious characteristics of experience-based consumption: tourists with 0-5 dives account for 50.3% of the total, indicating that the market is dominated by beginners. Combining data from popular tourist areas, it can be inferred that the main motivation for these tourists to participate in diving activities is the desire for a short-term experience (Dai et al., 2024). It is recommended that destinations optimize their product mix for this group, such as introducing "diving + island sightseeing" one-day tour packages to lower the threshold for participation.

Reliability and Validity Analysis

This study used SPSS 26.0 statistical software to conduct reliability analysis on the scale data (Norusis & Inc, 2004). For the Composite Scale, which consists of 13 items, Cronbach's α coefficient was used to test its internal consistency. The results showed that the **Cronbach's α values of the subscales were all within the range of 0.816 to 0.860**, meeting the statistical standard for "high reliability" (Cronbach's $\alpha > 0.80$). The results indicate that: (1) Internal consistency: The items in the scale are highly homogeneous, indicating that the measurement tool can effectively capture the core characteristics of the target sample; (2) Reliability: The research data can be verified repeatedly, meeting the requirements of quantitative research for measurement stability; (3) Structural stability: The α values of each dimension are evenly distributed, verifying the rationality of the multidimensional structure of the scale. The findings of this study confirm that the scale has high psychometric properties in measuring tourists' constructs related to value co-creation and willingness to participate, providing a reliable data basis for subsequent validity analysis and hypothesis testing.

This study employed exploratory factor analysis (EFA) to examine the construct validity of the scale structure. Specifically, the Kaiser-Meyer-Olkin (KMO) test (Sung-Jin & Ryu, 2015), Bartlett's sphericity test (Tobias & Carlson, 1969), and cumulative variance contribution rate (CVCR) (Liu & Owen, 2006) were used to comprehensively evaluate data suitability. (1) The KMO test results showed that **KMO = 0.808**, significantly higher than the acceptable threshold of 0.8 for validity, indicating that there was a strong common factor structure among the items of the scale and that the data were suitable for factor analysis ($p < 0.001$). (2) The Bartlett spherical test showed that $\chi^2 = 2785.069$, $df = 78$, significance level $p < 0.001$ (Sig. = 0.000), rejecting the null hypothesis (i.e., no correlation between variables), further verifying the non-unit characteristics of the data matrix and supporting the feasibility of factor analysis. (3) The cumulative variance contribution rate shows that the cumulative variance explained by the common factors extracted by factor analysis reached **77.20%**, indicating that the scale can effectively capture the core information of the target construct and that the construct validity meets academic research standards. Based on the above analysis, this study's scale has significant structural validity advantages in measuring the factors influencing value co-creation among divers and their willingness to participate, providing reliable data support for subsequent hypothesis testing and theoretical model verification.

This study used principal component analysis (PCA) combined with maximum variance orthogonal rotation to explore the factor structure of the scale data (Tipping & Bishop, 2010). The factor loading matrix shows that the loadings of each item on its respective factor are greater than 0.5, and the cross-loadings are less than 0.4, verifying the discriminative power and explanatory power of the factor structure. Further, convergent validity was assessed by combining composite reliability (CR) and average variance extracted (AVE) (Li & Lay, 2024). (1) The results of the composite reliability (CR) indicate that the **CR values of each latent variable range from 0.881 to 0.909**, all of which are higher than the critical value of 0.7, indicating that the measurement model has high internal

consistency. (2) The Average Variance Extracted (AVE) results indicate that the **AVE values for each latent variable range from 0.650 to 0.770**, all exceeding the recommended standard of 0.5. This suggests that the latent variables can explain **more than 65%** of the variance in their measurement items, further validating the convergent validity of the measurement model (Margolis et al., 2006). Based on the above analysis, the scale developed in this study meets academic research standards in terms of factor structure and convergent validity, providing a reliable data foundation for subsequent structural equation modelling (SEM) analysis.

Table 4.2 Reliability and Validity Test Table

Factors	Variable	Factor Loading	Cronbach'a	CR Value	AVE Value
Environmental Awareness	EA-1	0.867	0.885	0.909	0.770
	EA-2	0.831			
	EA-3	0.931			
Value Perception	VP-1	0.84	0.868	0.890	0.729
	VP-2	0.829			
	VP-3	0.891			
Emotional Experience	EE-1	0.862	0.846	0.907	0.765
	EE-2	0.861			
	EE-3	0.901			
Willingness To Participate	WP-1	0.790	0.860	0.881	0.650
	WP-2	0.811			
	WP-3	0.811			
	WP-4	0.813			

(Source: Compiled by researchers based on survey data)

To verify the discriminant validity of each latent variable in the research model, this study used Pearson correlation analysis to test the correlation between the core constructs (Yang et al., 2021). The results showed that environmental awareness, value perception, and emotional experience were significantly positively correlated with willingness to participate ($p < 0.01$). The specific correlation coefficients and significance levels are as follows: (1) In a study on the correlation between tourists' environmental awareness and willingness to participate, $r = 0.406$, $p < 0.01$; (2) In a study on the relationship between tourists' value perception and willingness to participate, $r = 0.438$, $p < 0.01$; (3) In a study on the relationship between tourists' emotional experiences and their willingness to participate, $r = 0.398$, $p < 0.01$. Although statistically significant correlations were found among the above constructs, the correlation coefficients were all below the threshold of 0.5, indicating that the constructs maintain moderate theoretical relevance without conceptual overlap.

MODEL ANALYSIS AND DISCUSSION

Based on the results of the aforementioned validity and reliability tests, this study used SmartPLS 3.0 software to construct a structural equation modelling (SEM) to verify the causal relationship assumptions between latent variables in the theoretical model and obtained the structural equation model as shown in the figure (Ayu et al., 2024).

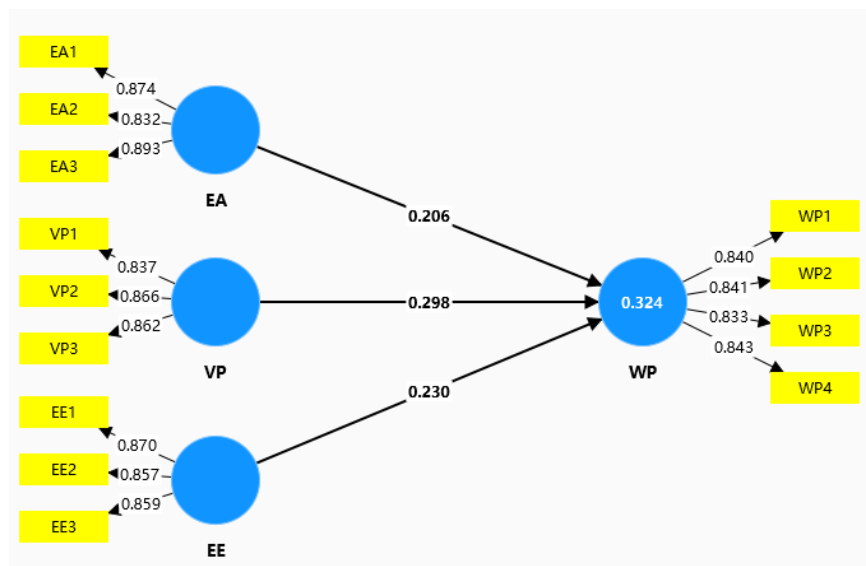


Figure 4.1 Structural Equation Model Diagram

The model estimation uses Partial Least Squares path modelling technology and obtains Standardized Path Coefficients through an iterative algorithm. The estimation results are shown in the table below.

Table 4.3 Curve Fitting Results of Hypothesis Testing (N=384)

Fitting Indicators	Inspection Criteria	Inspection Value	Inspection Results
Chi-square	-	382.085	-
SRMR	<0.08	0.055	Fit
d_ULS	<0.95	0.273	Fit
d_G	<0.95	0.150	Fit
NFI	>0.80	0.850	Fit

This study uses Goodness-of-Fit Indices to comprehensively evaluate the fit between the measurement model and the sample data (Cheung & Rensvold, 2002). (1) The Standardized Root Mean Square Residual (SRMR) shows that **SRMR = 0.055**, which is significantly lower than the threshold standard of 0.08, indicating that the difference between the residual matrix and the unit matrix is within an acceptable range. (2) The Unweighted Least Squares Distance (d_ULS) shows that **d_ULS = 0.273**, which is less than the critical value of 0.95. (3) The Geodesic Distance (d_G) shows that **d_G = 0.150**, which is also lower than the reference standard of 0.95. (4) The Normed Fit Index (NFI) shows that **NFI = 0.850**, which falls within the reasonable range of 0.80 to 0.90, indicating that the model explains the variation in the data better than an independent model. Based on the above indicators, the measurement model in this study meets the academic research standards for overall fit, indicating that the theoretical model fits the sample data well. This provides a reliable foundation for subsequent path analysis and hypothesis testing using structural equation modelling.

Table 4.4 Results of the Overall Research Model Hypothesis Verification

Path	β	S.E.	C.R.	P	LLCI	ULI
WP <--- EA	0.208	0.050	4.155	0.000	0.110	0.305
WP <--- VP	0.230	0.049	4.687	0.000	0.132	0.327
WP <--- EE	0.298	0.050	5.978	0.000	0.199	0.393

(* $p < 0.05$, ** $p < 0.01$ *** $p < 0.001$)

This study uses structural equation modelling path analysis to systematically test the significance and direction of the hypothesized relationships between latent variables. Specific indicators analyzed include standardized path coefficients (Wright, 1934), standard errors (Dowd et al., 2014), t-statistics (Winship & Zhuo, 2020), and p-values (Vidgen & Yasseri, 2016). (1) Path coefficient signs indicate the directionality of causal relationships between variables, with positive signs indicating positive effects and negative signs indicating negative effects. (2) P-value significance indicates whether the path coefficient is significantly different from zero based on a two-tailed test. When the P-value is less than 0.05, it indicates that there is a significant association between variables at the 95% confidence level ($p < 0.05$). (3) Effect size interpretation combines standardized path coefficients and P-values to comprehensively assess the theoretical explanatory power and practical significance of the hypothesized paths. The path analysis results in Table 4.4 show that: (1) The P-values of the hypothetical paths of environmental awareness, value perception, and emotional experience on tourists' willingness to participate are all **0.000 ($p < 0.05$)**, and the t-statistics are all greater than **1.96 (critical value)**, indicating that there is a significant causal relationship between the variables. (2) The sign direction of the path coefficients is **consistent with** the theoretical hypothesis, verifying the directional hypothesis of the variable relationships in the research model. (3) Environmental awareness, value perception, and emotional experience all have a significant impact on tourists' willingness to participate, but the degree of impact is different, **with emotional experience having the greatest impact, followed by value perception, and finally environmental awareness.**

RESEARCH CONCLUSIONS AND RECOMMENDATIONS

Research Conclusions

This study uses the theory of value co-creation as its core theoretical framework and collects data through a structured questionnaire design, ultimately obtaining 384 valid samples. The sample widely covers tourist groups with different genders, nationalities, diving experiences, consumption frequencies, and diverse demographic characteristics, ensuring the representativeness and comprehensiveness of the research sample. In the data analysis stage, this study first used SPSS 26.0 software to conduct Pearson correlation analysis to

preliminarily explore the strength of linear relationships between variables and their direction of influence. Subsequently, based on partial least squares structural equation modelling, SmartPLS 4.0 software was used to construct a theoretical model, and iterative algorithms were used to accurately estimate standardized path coefficients, thereby rigorously testing the research hypotheses. The core objective of this study is to thoroughly analyze the intrinsic mechanism of the relationship between factors influencing consumer participation in value co-creation and consumer willingness. The results show that consumers' environmental awareness, value perception, and emotional experience all have a positive and significant impact on their willingness to participate. This study further reveals a multi-level diving tourism ecosystem and confirms that enhancing divers' environmental awareness, value perception, and emotional experience can significantly increase their willingness to participate in the value co-creation process. This study not only expands the scope of existing research but also empirically verifies these key structures in the specific context of a survey of divers visiting Malaysia, providing insights with practical guidance and policy reference value for promoting the sustainable development of Malaysia's diving tourism industry.

Research Recommendations

Tourists' environmental awareness has a significant positive impact on their willingness to participate in value co-creation, indicating that establishing correct environmental awareness among tourists has a greater impact on their willingness to participate in value co-creation, and therefore has a more obvious effect on promoting local economic development (J. Wang et al., 2024). Although the environmental awareness of many divers is gradually improving, it is still difficult for them to develop a correct understanding of environmental protection, form a positive attitude toward environmental protection, and stimulate intrinsic motivation for environmental protection during diving trips (Ong & Musa, 2012). As indispensable participants in tourism activities, all parties, including tourism enterprises, local communities, and governments, have failed to give full play to their guiding role in helping tourists establish the above-mentioned environmental protection concepts (Oracion, 2007). Take the hotels on the islands of Semporna, Redang, and Sipadan as examples. Although they actively promote environmental protection by discouraging the use of disposable tableware, in practice they still provide unlimited quantities of such items to customers, failing to effectively guide customers to develop proper environmental awareness, attitudes, and motivation. Residents should deeply recognise that establishing and practising correct environmental awareness, attitudes, and motivations will not only help protect the scenic area's tourism environment and enhance tourists' sensory experiences and comfort but also strengthen tourists' sense of social responsibility and participation (Cheng & Wu, 2015). This positive environmental concept and behaviour will further permeate the daily lives of tourists, promoting the formation of a virtuous cycle of interaction between tourist destinations and tourists. Because of this, local governments should actively encourage and guide all sectors of society to participate in environmental protection and promote the establishment of correct environmental awareness, attitudes, and motivations among all participants in the process of promoting and opening up diving tourism sites. Specifically, on the one hand, it is necessary to strengthen publicity, education, and guidance, create a good atmosphere of respect for nature, care for the environment, and actively protect and construct the environment throughout the entire diving island tour, and strive to build resource-saving and environmentally friendly islands (Sun & Zhang, 2022). On the other hand, it is necessary to start from the perspective of tourists and, through active publicity and reasonable guidance, enhance the awareness of tourists of the harmonious coexistence of tourists and the scenic spot environment (Budowski, 1976).

Tourists' value perception has a significant positive impact on their willingness to participate in value co-creation. This shows that emotional experiences have an important influence on tourists' participation in value co-creation. During the tourism experience, "pleasant mood" and "novel experience" are key factors that have a significant impact on tourists' emotional value perception (Goossens, 2000). This phenomenon reflects that tourists increasingly value the psychological satisfaction of island diving tourism. With the continuous development of society and the economy, tourists' demands have risen from basic physical comfort to higher levels of psychological satisfaction and the pursuit of achievement. Because of this, the value of diving tourism needs to be deeply integrated with the folk culture and regional characteristics of tourist destinations to stimulate tourists' psychological identification and thereby increase their willingness to spend (Arin & Kramer, 2002). If diving tourism loses its value perception function, which is its cornerstone, then emotional value perception and social value perception will lose their foundation, making sustainable development difficult to achieve. Value perception encompasses both practicality and commemorative value, with experience as the core element. This is a key feature that distinguishes diving tourism from other similar tourism products. A high-quality diving tourism experience can become a wonderful vehicle for tourists to remember their trip (Fuchs et al., 2016). However, the realization of experiential tourism depends on the effective support of basic functions related to

value perception. If diving tourism cannot guarantee even basic functions, the experience of tourists will be greatly reduced. Therefore, when planning customer experience design, diving tour operators should comprehensively consider the organic integration of functional value, emotional value, and social value to ensure that products not only meet the basic needs of tourists but also provide meaningful experiences and valuable memories, thereby achieving a comprehensive improvement in the cost-effectiveness of diving tourism.

The emotional experience of tourists has a significant positive impact on their willingness to participate in value co-creation. The positive impact of tourists' emotional experience is most significant, indicating that the pleasant feelings they obtain during diving tourism play a decisive role in enhancing their willingness to participate. With the evolution of society and the improvement of people's quality of life, tourists' demands for travel experiences are no longer limited to material satisfaction but are increasingly inclined toward spiritual enjoyment and a deep pursuit of cultural experiences (Kler & Tribe, 2012). With its unique cultural experiences and emotional connection mechanism, diving tourism effectively meets tourists' dual needs for novel experiences and emotional fulfilment. The effect of emotional value also reveals that when choosing diving tourism, tourists not only pursue personal enjoyment but also hope to strengthen social connections and build identity through such tourism activities (Prasetyo et al., 2023). This demand has become an internal driving force for the development of diving tourism, requiring diving tourism products to build social platforms to promote interaction and experience sharing among tourists during the tourism process. At the same time, the impact of perceived tourism value highlights tourists' careful consideration of the cost-effectiveness of diving tourism. Unreasonable pricing may lead tourists to perceive that they are not getting value for their money, thereby reducing their satisfaction levels. Because of this, to enhance tourist satisfaction, the diving tourism sector needs to continue to promote innovation and differentiation strategies to avoid the trap of homogenized competition (Garrod, 2007). By deepening the integration of culture and tourism, diving tourism can more thoroughly explore and showcase local cultural characteristics and provide unique and charming tourist experiences, thereby attracting and satisfying the diverse needs of different tourist groups.

Contribution and implications

This study examines influencing factors that affect the willingness of Malaysian dive tourists to engage in value co-creation as a way to enhance the service quality and service system of diving in Malaysia. The research findings of this study provide unique insights in terms of research theory, research methodology and research practice, which provide reference value for the diving industry.

From the perspective of research theory, this study aims to systematically analyse the key factors influencing diving tourists' participation in value co-creation, and through rigorous empirical analysis, clarify the intrinsic association mechanism between Environmental Awareness(EA), Value Perception(VP) and Emotional Experience (EE). Through rigorous empirical analyses, we have clarified the intrinsic correlation mechanism between Environmental Awareness (EA), Value Perception (VP) and Emotional Experience(EE), and constructed a theoretical logical framework among the three, thus providing new theoretical perspectives and empirical evidence to deepen the academic knowledge on the factors influencing the willingness of dive tourists to participate in the value co-creation. Based on this foundation, this study further focuses on how, to optimise the three core dimensions of environmental Awareness(EA), Value Perception(VP) and Emotional Experience(EE). A series of actionable strategies are proposed, aiming to provide innovative practical paths for dive tourism service providers to improve service quality and enhance the effectiveness of tourists' participation in value co-creation. In addition, the empirical data in this study demonstrated that diving tourists' participation in marine environmental protection shows significant potential for improvement, which provides positive practical insights for the sustainable development of the diving tourism industry.

In terms of research methodology, Structural Equation Modeling(SEM), with the help of Smart-PLS software, can systematically sort out and accurately quantify the complex correlations between different variables, providing a rigorous and robust theoretical framework for revealing the intrinsic mechanism of interaction between variables. By scientifically constructing and rigorously verifying the research hypothesis model, this study deeply analyses the influencing factors of the willingness of dive tourists to participate in value co-creation and their paths of action, which not only provides a solid theoretical foundation for comprehensively and meticulously describing the mechanism of the formation of the willingness of dive tourists to participate in value co-creation but also establishes a clear, coherent research logic and ideas for subsequent research. In order to ensure the reliability and validity of the research findings, this study adopts the random sampling survey method to collect data and passes the strict reliability and validity test to ensure the scientificity and accuracy of the assessment system. On this basis, the model constructed in this study, due to its strong representativeness and universality, not only provides strong support for the in-depth research in the field of dive tourism services

in Malaysia but also provides a reference paradigm for the academic exploration and practical application of the dive tourism industry in other countries.

In terms of research practice, this study significantly fills the research gap in the dive tourism industry, especially in the field of dive tourism in tropical countries represented by Malaysia, and the results of this study are of great practical significance in promoting the transformation, upgrading and sustainable development of the local tourism industry because of the flourishing development of the dive tourism industry in Malaysia. Through an in-depth analysis of the development status quo and challenges of Malaysia's diving tourism industry, this study not only provides empirical evidence and strategic recommendations for the optimisation and upgrading of Malaysia's local tourism industry but also contributes valuable practical wisdom and theoretical references for the synergistic development of the diving tourism industry in Southeast Asia and even globally. In addition, the research framework constructed in this study through empirical validation effectively reveals the intrinsic driving mechanism of dive tourists' willingness to participate in value co-creation, and further clarifies the core roles of Environmental Awareness(EA), Value Perception(VP) and Emotional Experience(EE) in stimulating the value co-creation behaviour of dive tourists. These empirical research methods and findings not only fit in with the wide recognition and in-depth exploration of value co-creation theories in the current academic community but also provide empirical paths and theoretical perspectives that can be drawn upon for subsequent research (Phi & Dredge, 2021; Wanpiyarat et al., 2025).

RESEARCH CONCLUSION AND FUTURE STUDIES

Research Conclusion

Focusing on the Malaysian dive tourism context, this study systematically and comprehensively analyses the determinants of tourists' willingness to engage in value co-creation. Using a rigorously validated scale instrument, the study explored the role of three core variables, namely Environmental Awareness(EA), Value Perception(VP) and Emotional Experience (EE), on tourists' willingness to participate in value co-creation. EE three core variables on tourists' willingness to engage in value co-creation.

The results of the empirical study show that Environmental Awareness(EA), Value Perception(VP) and emotional Experience(EE)all have significant positive effects on tourists' willingness to participate in value co-creation. Specifically, when tourists' environmental awareness is improved, their willingness to participate in value co-creation in the process of dive tourism will be enhanced; as tourists' perception of the value gained in the process of diving deepens, their willingness to participate in value co-creation in Malaysia's dive tourism will be significantly increased; in addition, strengthening the tourists' emotional experience in dive tourism can also effectively enhance their willingness to participate in value co-creation. In addition, strengthening tourists' emotional experience in diving tourism can also increase their willingness to participate in value co-creation.

Future Studies

Although this study provides highly valuable insights into the correlation between the improvement of diving service capabilities and tourism development in Malaysia, it is still necessary for future research to further deepen the understanding of the issues involved in this study and expand its applicable scope. Specifically, the research perspective can be extended to other industry fields and different geographical regions to enhance the universality of the research conclusions, and thereby obtain comparative analysis perspectives under different cultural contexts, economic environments, and regulatory frameworks, providing a more comprehensive and diverse reference basis for related field research.

This study focuses on the diving tourism context in Malaysia and explores tourists' willingness to participate in value co-creation. It aims to analyze the three key factors that influence tourists' willingness to participate, with the hope of providing theoretical support and practical guidance for the development of Malaysia's diving tourism industry. However, during the research process, due to limitations in data collection capabilities, there were certain limitations in the data collection, recording, and organization stages, resulting in insufficient data references and making it difficult to comprehensively and accurately reflect the actual situation. At the same time, given the researchers' insufficient knowledge and theoretical background, the analysis of relevant corporate countermeasures only represents personal views and maybe one-sided and limited. In addition, the survey and analysis of the diving tourist group in this study were not detailed and in-depth enough, failing to comprehensively grasp the characteristics and needs of this group, which is also an important shortcoming of this study. In light of this, future research could further expand data collection channels, enhance the breadth and depth of data collection, and conduct subsequent studies based on deeper theoretical research. This would likely result in more comprehensive, scientifically sound, and practical research outcomes.

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