Article

Activation path of Yunnan folk pottery based on feature cognition and value evaluation

Jiarui Yu[1,2], Verly Veto Vermol[2,*], Salwa Ayob[2]

[1] School of Art Design and Jewelry, Bao Shan University, Baoshan 678000, China
[2] College of Creative Arts, Universiti Teknologi MARA, Shah Alam 40450, Malaysia
* Corresponding author: Verly Veto Vermol, verly@uitm.edu.my

Abstract: Yunnan is rich in cultural heritage, with its primitive pottery techniques coexisting with modern pottery techniques, and is known as the "Museum of Ceramic History". Due to regional and socio-economic development factors, some folk pottery and craftsmen have faded out of sight or only circulated in a few small areas and specific environments. The study analyzes and summarizes the characteristics of Yunnan folk pottery and industry and evaluates the Yunnan folk pottery value based on the conditional valuation method. The study takes the folk pottery of the Bai nationality in Dali, Yunnan as an example and obtains the evaluation results of the purchasing motivation value of the pottery through a questionnaire survey. 45.26% of people pay for their existence value, 26.03% pay for their choice value, and 28.71% pay for their legacy value. Based on the evaluation results, the study proposes targeted activation paths for Yunnan folk pottery, including innovative development combined with new technologies, highlighting the functional characteristics of pottery, and brand building. This study will help Yunnan folk pottery find more suitable ways of protection and inheritance in the rapid development of materials and technology. This study can help inheritors gain the possibility of sustainable development and provide reference value for the activation path of other traditional folk.

Keywords: Yunnan; folk pottery; activation path; feature cognition; value valuation

1. Introduction

Yunnan is located on the southwestern border and, as one of the birthplaces of civilization, has a long history of pottery making. In history, multiple ethnic minorities have taken root and developed here, forming a situation of multi-ethnic integration and coexistence (Huang et al., 2023). In this context, various cultures are constantly colliding and exchanging, affecting the pottery making process in Yunnan. As a result, Yunnan folk pottery carries rich historical and cultural values and humanistic spirit (Zhang and Pollard, 2022). However, as the social and economic development continues, Yunnan folk pottery goes through several twists and turns. Some of them begin to gradually fade out of the public's view (Li et al., 2023). Therefore, it is urgent to propose new activation paths to promote the further development of folk pottery in Yunnan (Hong and Kim 2021). In existing research, there are few evaluations of the non-use value of cultural industries such as pottery. These evaluation methods have limitations such as incomplete consideration of factors (Miłaszewski, 2021). The technological and industrial characteristics of Yunnan folk pottery are very important for its development direction and mode. Therefore, the study first analyzes the technological and industrial features of pottery through feature recognition, and then evaluates its non-use value through the Conditional Valuation Method (CVM). The

research innovation lies in proposing a development analysis method for Yunnan folk pottery based on feature recognition and value evaluation. This method fully considers the technological and industrial characteristics and non-use value of Yunnan pottery. The research aims to effectively evaluate the Yunnan folk pottery value through the proposed method to determine its activation path and promote the development of pottery cultural heritage.

Related works

CVM is an economic method that evaluates the value of non-market resources by simulating market conditions and asking respondents about the amount they are willing to pay under specific hypothetical scenarios. CVM has a wide range of discussions and applications in various fields. Ku et al. (2022) started with the evaluation of transportation efficiency and used CVM to evaluate it. This study fully considered the pedestrian factor and the time-saving effect of vehicle travel. The proposed method effectively reflected the landscape and pedestrian connectivity effects of pedestrians, which had positive significance for traffic project evaluation. Firdaus et al. (2023) adopted the travel cost method, CVM, and hedonic pricing method to analyze the economic value of tourist attraction relocation to evaluate its impact on the local economy. The proposed fusion method effectively calculated the total economic value of the region, which was helpful for the formulation of tourism policies. Lee et al. (2020) evaluated the willingness of the public to pay for bicycle facility construction from an environmental perspective and based on CVM. This method effectively analyzed user preferences for bicycle lane types, which helped policy makers make decisions for new bicycle facilities and improve cycling skills. Ciocoiu and Mihăilă (2021) evaluated the cultural heritage value from the perspective of sustainable development based on CVM and lifecycle assessment methods. The proposed method effectively estimated the value of cultural heritage from the perspective of consumer Willingness to Pay (WTP). Jung and Lee (2021) evaluated the willingness of the people to pay using CVM from the perspective of non-use value evaluation of Confucian symbol trees. Respondents were willing to pay a certain amount of money to protect cultural heritage and believed that respondents with higher functional value were more likely to pay more.

In summary, CVM has achieved certain research results in various fields. However, there is still room for research on the non-use value evaluation of pottery. Therefore, this study attempts to apply CVM to the non-use value evaluation of folk pottery in Yunnan to help analyze its industrial activation path.

2. Analysis of the current development status of Yunnan folk pottery based on feature recognition and value evaluation

2.1. Analysis of the characteristics and industrial characteristics of Yunnan folk pottery based on feature cognition

In many villages in Yunnan, pottery making is not only a manual skill, but also a way of life that carries rich cultural customs and traditions. In some villages, every New Year or important festival, every household will use homemade new pottery to

dress up food, symbolizing harvest and prosperity. Local craftsmen skillfully integrate pottery techniques from different ethnic groups to create magnificent pottery, earning praise. These traditions and stories not only endow pottery with unique cultural connotations, but also deepen people's understanding and recognition of its value.

Feature cognition refers to the ability to classify, discern, and understand specific things or phenomena by recognizing and understanding their significant characteristics (Yavari et al., 2021). In the context of folk pottery in Yunnan, feature recognition can be concretized into several aspects in **Figure 1**. Feature cognition is summarized as patterns, production techniques, cultural connotations, production methods, and market demands. Feature recognition can better classify, distinguish, and understand this traditional handicraft and its development.
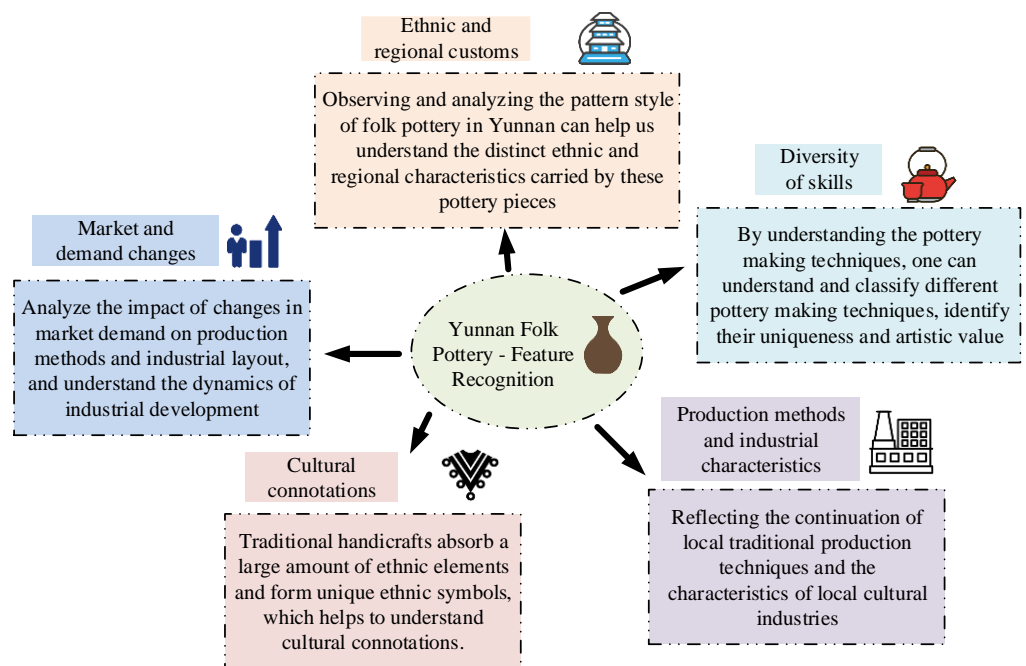

Figure 1. Cognitive characteristics of folk pottery in Yunnan.

Yunnan folk pottery has a long history and cultural information, and its pattern style carries distinct ethnic and regional customs and rich cultural connotations. There are various folk pottery techniques in Yunnan, including embossing, tapping, carving, tiling, and flower stacking. Traditional handicrafts have continuously absorbed and integrated ethnic elements in their formation and development, forming unique ethnic symbols in terms of skills, patterns, colors, and uses. The handicraft skills of Yunnan folk pottery have been constantly enriched with the changes of time, region, and culture (He and Zhang, 2021). For example, tea culture brings vitality to the pottery market. The circulation of different pottery making techniques in the market increases opportunities for communication and reference. After years of development, the production process of folk pottery in Yunnan has also become increasingly modern and refined. Many handicraft artists incorporate modern elements into pottery making, making it a combination of antique artistic value and modern aesthetic characteristics. However, the development of the pottery market is relatively unstable. Some Yunnan folk pottery is only circulated in specific regional environments. These craftsmen are

usually individual pottery makers based on their families (Lee, 2021). This family production method is a continuation of local traditional production techniques and a symbol of knowledge, as well as a characteristic cultural industry of the region.

It mainly relies on individual household labor and has small-scale industrial characteristics. In recent years, people's material quality of life has been continuously improved. The demand for fine pottery products has gradually increased. There are more and more pottery making professionals. In this situation, households mainly engaged in pottery making and selling gradually gather inside and outside the space of some villages, presenting the characteristics of small-scale agglomeration. The formation of small-scale industrial clusters is a process of continuous participation and integration of various producers, exhibiting dynamic characteristics. During this process, various techniques rapidly spread and developed within the region. The social network of acquaintances formed by production agglomeration promotes information resource sharing, which is conducive to product promotion in the early stages of the market. However, smaller industrial scales are unable to meet larger market demands, which hinders the further development of the industry and the widespread dissemination of skills.

2.2. Value evaluation of Yunnan folk pottery based on conditional valuation method

To expand the research perspective of Yunnan folk pottery and promote its industrial development and skill dissemination, it should comprehensively evaluate its culture, economy, and value (Sewunet et al., 2022). Currently, there are relatively few non-use value evaluation methods for the value of cultural industries such as pottery. This study utilizes CVM to evaluate the non-use value of Yunnan folk pottery (Liao et al., 2022). The non-use value of Yunnan folk pottery includes existence, selection, and legacy values. These values not only reflect the durability and inheritance of pottery as a cultural heritage, but also cover the potential impact of pottery on cultural preservation, aesthetic appreciation, and educational inheritance. Through the CVM method, the economic value evaluated by the research can reflect market demand and integrate non-economic benefits at the cultural and educational levels to ensure the comprehensiveness and multidimensionality of the evaluation results. When CVM is applied to study the value of cultural heritage, respondents express their maximum WTP under hypothetical changes in cultural heritage resources and use it as an evaluation criterion for non-use value. The non-use value is the total WTP, represented by Equation (1).

$$\text{WTP} = \sum_{i=1}^{K} AWP_i \frac{n_i}{N} \times M \tag{1}$$

In Equation (1), WTP refers to people's WTP for the pottery value, in the survey area, which can reflect the pottery's economic value; AWP_i refers to a person's WTP at the i-th level; n_i refers to the individuals number in the population whose WTP is AWP_i; N refers to the respondents number; M refers to the sample populations number (Kumar and Jindal, 2022).The sample size is crucial for the time, cost, and credibility of the survey. To determine the WTP probability and confidence of these

survey subjects, Equation (2) is utilized to determine the sample size.

$$n = \frac{Z_{a/2}^2 P(1-P)}{e^2} \tag{2}$$

In Equation (2), n refers to the sample size; Z refers to standardized normal variables; P refers to the WTP probability, with a value of 1/2; e refers to the tolerable error value, with a value of 0.05. The non-use value of Yunnan folk pottery mainly consists of existence, selection, and legacy values (Curt, 2022). Existence value refers to the fees voluntarily paid by individuals to ensure the sustainable existence of a certain resource. This value is related to the inherent economic attributes of resources themselves, rather than based on human actual use. Selection value refers to the cost paid by individuals and society for the potential use of heritage resources in the future. Legacy value refers to the cost that one is willing to pay to ensure the inheritance of pottery. The non-use value of pottery is represented by Equation (3).

$$\mathrm{NUV} = \mathrm{EV} + \mathrm{BV} + \mathrm{OV} \tag{3}$$

In Equation (3), NUV refers to the non-use value of the pottery; EV refers to the value of existence; BV refers to the value of choice; OV refers to the value of inheritance. Non-use value cannot be directly obtained, depending on people's acceptance and recognition, which belongs to a potential positive effect in terms of spirituality. The use value and non-use value of pottery are important components.

3. Analysis of the value evaluation results and discussion on the activation path of Yunnan folk pottery

3.1. Evaluation results of Yunnan folk pottery value

Taking Wayao Village in Yunnan as an example, this study evaluates the value of its pottery. The reason for choosing Wayao Village is that the household production of pottery in Wayao Village has already reached a certain scale. Families mainly engaged in pottery making and selling began to gather inside and outside the village space. There are more and more professionals in pottery making, which has a certain industrial market and can meet the sample size required for research. This study utilized CVM to evaluate the non-use value of pottery in Wayao Village. The study selected Wayao Village as the sample site, and based on the scale and representativeness of pottery production in the village, a total of 500 valid questionnaires were collected. The sample size was sufficient and representative. Taking Wayao Village as an example, Wayao Village has become an appropriate sample choice due to its large-scale pottery production. The household production of pottery in this village was widespread, which can reflect the actual cultural value and non use value of local folk pottery. The sample data covered respondents of different ages, incomes, and educational levels, ensuring the broad applicability of the results. The study improved the objectivity and scientificity of the data through random sampling.

Statistical analysis was conducted on the positive WTP questionnaire of respondents and local residents using SPSS software in **Figure 2**. The positive WTP skewness coefficient of the respondents was 2.39, and the kurtosis coefficient was

5.29, showing a left skewed and steep distribution at the peak. The highest average payment frequency was 100 yuan (39%), followed by 50 yuan (21%) and 20 yuan (11%). The arithmetic mean was 163.78 yuan, and the median was 61.18 yuan. The positive WTP skewness coefficient of local residents was 1.71, and the kurtosis coefficient was 2.41, showing a left skewed and flat distribution. The highest average payment frequency was 100 yuan (15.9%), followed by 10 yuan (13.3%) and 400 yuan (6.7%). The arithmetic mean was 146.41 yuan, and the median was 64.03 yuan.
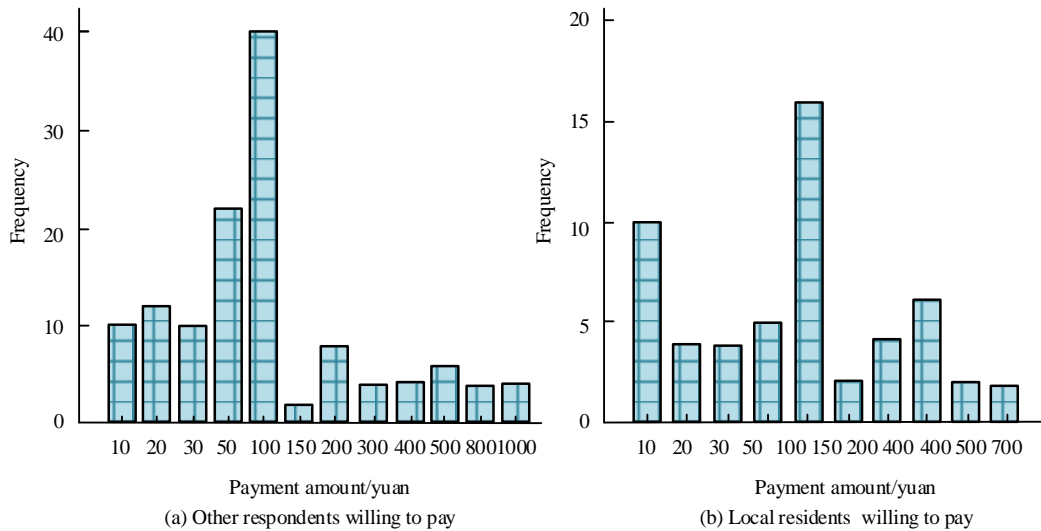

Figure 2. Positive willingness to pay among respondents and local residents.

The following data were obtained by analyzing the influencing factors of respondents' unwillingness to pay using SPSS software, as shown in **Figure 3**. For local residents, the main reason was the low-income level. Meanwhile, many residents were left behind elderly people who already had similar items at home, so they did not have the willingness to purchase. The main reasons for the remaining respondents were that pottery was unable to meet their consumption expectations (50%) due to high prices, making it inconvenient to carry (5%). Meanwhile, they had little understood of the pottery value and had relatively low attractiveness (8%). Moreover, they were concerned about damage during transportation, which increased the risk and cost of transportation (15%). In addition, pottery lacked sufficient practicality and was used less frequently in daily life (11%).
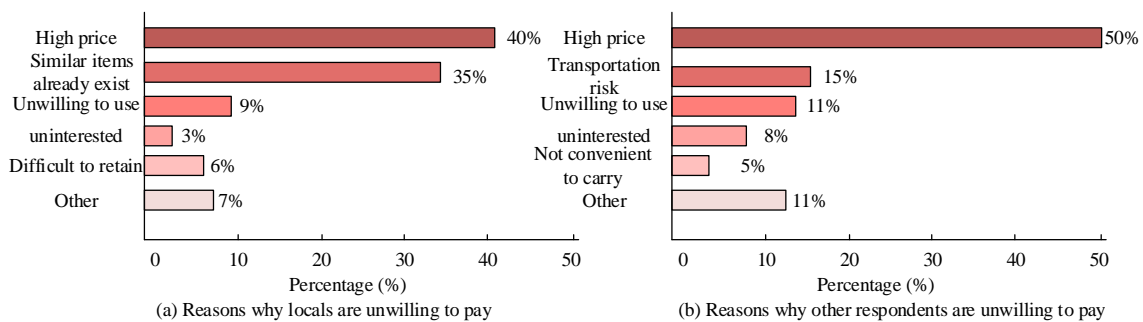

Figure 3. Factors influencing respondents' unwillingness to pay.

Figure 4 shows the survey results of respondents on non-use value payment

motivation. 34.18% of local respondents were willing to pay to ensure the sustainable existence (existence value) of pottery cultural heritage. 33.27% were willing to pay for the future utilization of cultural heritage resources (selection value). 31.54% were willing to pay for preserving traditional cultural heritage for future generations (legacy value). The remaining respondents were more inclined to pay for existence value, with 45.26% paid for its existence value, 26.03% paid for its selection value, and 28.71% paid for its legacy value. Therefore, the existence value, as an important component of WTP, was recognized by the majority of respondents.
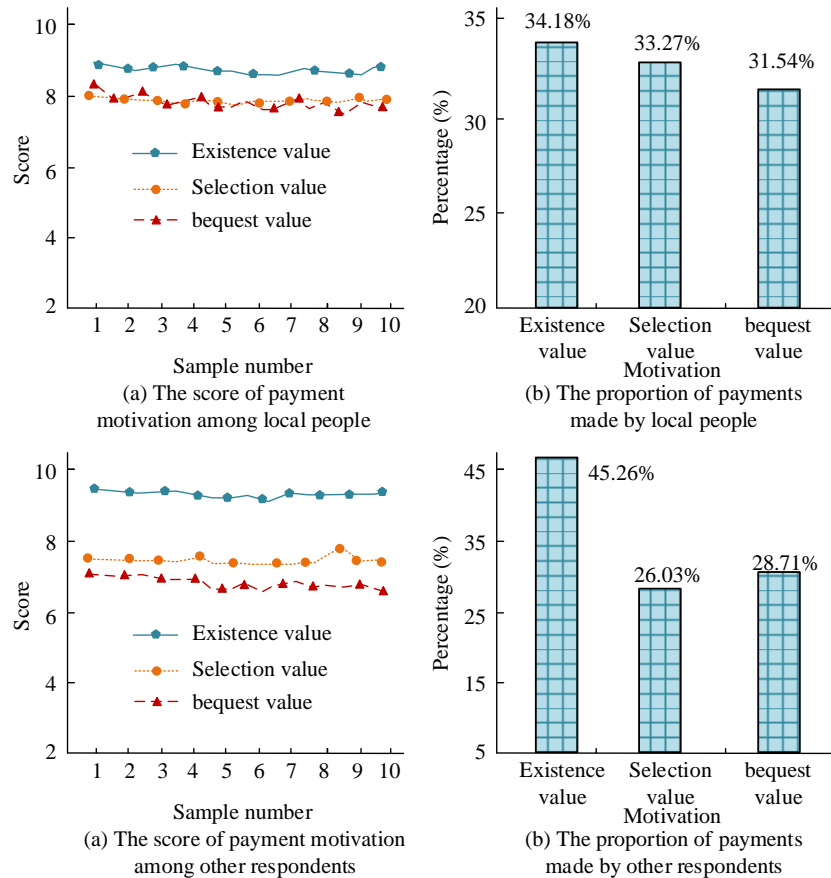

Figure 4. Survey results of respondents on non use value payment motivation.

Table 1. Logit test results of respondents.

/	Coefficient estimation (B)	Standard error (S.E)	Wald	Significance (sig)	Exp (B)	95% confidence interval	
						Upper limit	Lower limit
Understanding level	0.619	0.168	14.011	0.000***	1.862	1.343	2.572
Satisfaction level	0.542	0.215	6.300	0.011**	1.724	1.123	2.641
Income level	0.343	0.064	29.929	0.000***	0.708	0.622	0.798
Donation frequency	0.162	0.143	1.211	0.265	1.175	0.878	1.559
Age	0.097	0.159	0.371	0.538	1.103	0.801	1.513
Occupation	−0.139	0.069	4.110	0.040**	0.866	0.751	0.991
Educational level	0.781	0.201	15.253	0.000***	2.177	1.473	3.216

Note: *, * *, and * * * respectively indicate significance at statistical test levels of 0.1, 0.05, and 0.01.

The Logit test of respondents was conducted in **Table 1**. The regression

coefficients of understanding, income, and cultural levels were relatively large ($P <$ 0.01), indicating that these factors directly affected tourists' WTP. The higher the understanding, income, and education level, the stronger their WTP. In addition, higher satisfaction and occupational differences also significantly affected WTP ($P <$ 0.05). The Logit prediction model constructed based on the above variables showed that these factors affected payment behaviors obviously, with a calculated value of P = 0.99. Therefore, the five factors in **Table 1** obviously affected payment behaviors.

3.2. Discussion on the activation path of Yunnan folk pottery

Yunnan folk pottery, as a traditional handicraft with a long history and profound cultural connotations, faces many challenges and opportunities in the development of modern society. The study evaluated the non-use value of pottery using the CVM method. Based on the industry characteristics and value evaluation results proposed by the research, the activation path can be considered from the following aspects. The survey results confirmed that among the influencing factors of respondents' unwillingness to pay, 11% believed that pottery was not practical enough and had a low frequency of use in daily life. In response to this phenomenon, the activation path can consider developing practical and decorative products, such as tea sets, tableware, flower sets, etc., to meet the diverse needs of consumers. Secondly, the material and craftsmanship of pottery were improved to enhance its durability and ease of cleaning, while promoting portable design to facilitate consumers' use in different occasions. Finally, by collaborating with designers, it aimed to create pottery that combines aesthetics and functionality, enhancing the attractiveness and added value of the product while meeting daily usage needs. In addition, emphasis was placed on the portability and safety of the product, addressing the issues of inconvenience in carrying and transportation risks.

The survey results on payment motivation indicated that consumers had a strong sense of identification with traditional handicrafts, with 34.18% of local respondents and 45.26% of the remaining respondents willing to pay to ensure the existence value of pottery. Meanwhile, pottery's technical characteristics also exhibited a combination of ancient artistic value and modern aesthetics. Therefore, the second activation path can consider further combining modern design concepts for creative design. Therefore, the product can retain both traditional features and conform to modern aesthetics, thereby attracting more consumers. Moreover, craftsmen can try to integrate modern technology into traditional ceramic practice methods. Craftsmen can improve the accuracy and efficiency of pottery production by introducing advanced technologies such as 3D printing and laser engraving, while ensuring the preservation of traditional handmade craftsmanship. Modern glaze formulas and firing techniques can also be utilized to make pottery more durable and aesthetically pleasing.

The respondents' positive WTP was significantly correlated with their income, culture, and understanding of the pottery value ($P < 0.01$). Satisfaction and occupation also had a certain impact on WTP ($P < 0.05$). Tourists' WTP was mainly concentrated at around 100 yuan (39%), while local residents' WTP was relatively low and scattered. These results indicated that improving the public's awareness of the pottery value through existing technological means could help enhance its WTP. Finally,

Yunnan folk pottery exhibited a small-scale agglomeration phenomenon. Further expanding market size can be achieved through brand building. Meanwhile, ceramic art exhibitions can be held and widely publicized through the Internet and social media platforms. This can expand the audience to enhance brand influence and attract more potential consumers.

Finally, the dynamism and instability faced by Yunnan folk pottery in the market need to be addressed through various strategies. Firstly, strengthening market research, closely monitoring consumer preferences and market trends, and adjusting product design and production strategies in a timely manner can adapt to changes in market demand. Secondly, by diversifying product lines, seasonal limited products, and customized services, it can attract different consumer groups and increase market elasticity. Finally, it will establish and improve sales channels, combining online and offline sales models to resist the impact of market fluctuations.

The long-term strategic plan for the sustainable development and cultural heritage protection of Yunnan folk pottery should include three aspects: inheritance, project funding, and international exchange. The system's skill inheritance mechanism needs to be established, a specialized pottery training center needs to be established, and skill training and seminars need to be conducted regularly. Senior craftsmen should be invited to give lectures to cultivate young craftsmen. At the same time, pottery courses in primary and secondary schools should be established, and combined with local cultural education, it aims enhance students' understanding and interest in traditional pottery. It is also necessary to compile and publish textbooks and documentaries related to Yunnan pottery, to preserve its historical and technical details. The cultural industry fund needs to be established to support pottery production and innovation projects, and promote industrial upgrading. Finally, the development of international cultural exchange activities is also extremely necessary, as it helps to expand the global market, enhance the international influence and recognition of Yunnan folk pottery, and achieve its long-term development goals.

4. Conclusion

To explore the activation path of Yunnan folk pottery in the current era, a development analysis method for Yunnan folk pottery based on feature cognition and value evaluation was proposed. The study conducted empirical analysis and the results showed that the skewness coefficient and kurtosis coefficient of the respondents' positive WTP were 2.39 and 5.29, respectively. The skewness coefficient of local residents' WTP was 1.71, and the kurtosis coefficient was 2.41. The remaining respondents were more inclined towards value-based payments, with 45.26% paying based on their existing value, 26.03% paying based on their chosen value, and 28.71% paying based on their legacy value. The level of understanding, income, education, satisfaction, and occupation of the masses had a significant impact on their payment behavior. Based on the obtained data, the proposed activation path included developing practical and decorative products, combining modern design concepts for creative design, improving public awareness of the value of pottery, and expanding market size through brand building. Therefore, the method proposed by the research can guide the development path of folk pottery in Yunnan and has practical

significance.

The case study of Wayao Village in Yunnan has certain limitations, mainly including the limitation of its geographical representativeness, which may not fully reflect the diversity of folk pottery in the entire Yunnan region. In addition, there are potential limitations to using Logit models to predict payment behavior, as the linear assumption of logarithmic probability in the model may not fully reveal complex payment intentions. Meanwhile, the independence assumption of irrelevant alternative solutions (IIA assumption) may not be applicable to actual situations, affecting the accuracy of predictions. These limitations need to be addressed in future research by expanding the sample area and optimizing the model.

Author contributions: Conceptualization, VVV and JY; methodology, VVV; software, SA; validation, SA, VVV and JY; formal analysis, JY; investigation, JY; resources, JY; data curation, VVV; writing—original draft preparation, JY; writing—review and editing, VVV; visualization, SA; supervision, VVV; project administration, JY; funding acquisition, JY. All authors have read and agreed to the published version of the manuscript.

Conflict of interest: The authors declare no conflict of interest.

References

Ciocoiu, E., & Mihăilă, A. A. (2021). Economic Methods Used in Cultural Heritage Restoration and Maintenance. Managerial Challenges of the Contemporary Society. Proceedings, 14(1), 130-134.

Curt, C. C. (2022). Romanian Commitment to Independence of Justice and Anticorruption Reforms under CVM and Rule of Law Incentives. Some Considerations on Case-Law of the Constitutional Court. Transylvanian Review of Administrative Sciences, 65E, 48–63. https://doi.org/10.24193/tras.65e.3

Firdaus, H. S., Yusuf, M. A., & Bassam, A. (2023). The Economic Value Zone of Semarang Zoo Using Travel Cost and Contingent Valuation Method. Journal of Applied Geospatial Information, 7(2), 912–918. https://doi.org/10.30871/jagi.v7i2.5431

He, J., & Zhang, B. (2021). Current Air Pollution and Willingness to Pay for Better Air Quality: Revisiting the Temporal Reliability of the Contingent Valuation Method. Environmental and Resource Economics, 79(1), 135–168. https://doi.org/10.1007/s10640-021-00556-y

Hong, S. Y., Kim, S. H. (2021). Estimation of willingness to pay (WTP) of the cost of safe transportation for freight cars using the contingent valuation method (CVM). Journal of Navigation and Port Research, 45(6), 346-351.

Huang, J., Simatrang, S., & Joneurairatana, E. (2023). An Analysis of Ancient Xishuangbanna Dai Pottery Craft and Culture in Yunnan, China. The International Journal of Designed Objects, 17(2), 1–12. https://doi.org/10.18848/2325-1379/cgp/v17i02/1-12

Jung, J., & Lee, W. S. (2021). Estimating the preservation value of the confucianism symbol tree: application of the contingent valuation method. Anatolia, 32(3), 375–386. https://doi.org/10.1080/13032917.2021.1875014

Ku, D., Kweon, S., Kim, J., et al. (2022). Wider Benefits of Eco-Friendly Transportation Projects with Contingent Valuation Method. Chemical Engineering Transactions, 97(1), 133-138.

Kumar, S., & Jindal, V. (2022). Thermodynamic Re-assessment of the Nb-Zr System Using the CE–CVM Model for Solid Solution Phases. Journal of Phase Equilibria and Diffusion, 43(3), 277–286. https://doi.org/10.1007/s11669-022-00959-4

Lee, J. (2021). Estimating the Tourism Economic Value of TV Program using CVM-Focusing on Drama and Travel Entertainment Program. The Journal of the Korea Contents Association, 21(7), 171-180.

Lee, J. H., Han, S., & Shin, H. C. (2020). Benefit estimation for different types of bikeways using contingent valuation method. International Journal of Sustainable Transportation, 15(3), 175–186. https://doi.org/10.1080/15568318.2020.1718254

Li, Y., Yang, S., Han, D., et al. (2023). A Metal Production Center on the Southwest Frontier of the Han Empire: An Archaeometallurgical Study of the Heimajing Cemetery Site in Gejiu, Yunnan Province, China. Asian Perspectives, 62(1),

77–96. https://doi.org/10.1353/asi.2023.0004

Liao, N., Dai, J., Tang, Y., et al. (2022). iCVM: An Interpretable Deep Learning Model for CVM Assessment Under Label Uncertainty. IEEE Journal of Biomedical and Health Informatics, 26(8), 4325–4334. https://doi.org/10.1109/jbhi.2022.3179619

Miłaszewski, R. (2021). Application of the Contingent Valuation Method in Water Resources Protection. Central European Economic Journal, 8(55), 212–218. https://doi.org/10.2478/ceej-2021-0015

Sewunet, B., Gizeyatu, A., Lingerew, M., et al. (2022). On the use of contingent valuation method to assess factors affecting the contribution of local people for the management of water hyacinth in Lake Tana, northwestern Ethiopia. Environmental Science and Pollution Research, 29(58), 88147–88160. https://doi.org/10.1007/s11356-022-21846-y

Yavari, A., Moradi Ghiasabadi, B., Khoramnezhadian, S. (2021). Assessing the non-commercial values of environmental resources by using CVM; Case study: Siberian Crane. Fereydounkenar international wetland of Iran. Central Asian Journal of Environmental Science and Technology Innovation, 2(6), 227-237.

Zhang, Y., & Pollard, A. M. (2022). The archaeological and scientific analysis of blue-decorated ceramics in the Tang and Song dynasties. Archaeometry, 64(6), 1394–1410. Portico. https://doi.org/10.1111/arcm.12794