

Research on Chinese Rural Mural Design from the Perspective of Rural Revitalization

중국 시골 벽화 디자인 연구: 시골 부흥 관점에서

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Abstract

This study aims to explore the demands of users for the design of rural wall murals in China from the perspective of rural revitalization, and to propose suggestions for rural beautification. The research adopts a combined approach of qualitative semi-structured interviews and quantitative Analytic Hierarchy Process (AHP) to achieve a more objective investigation. Firstly, user suggestions and demands for improving rural wall murals were investigated through interviews, and key requirements were summarized. Secondly, AHP was applied to assign weights and rank the extracted key requirements. The research results indicate that users' demands for improving rural wall murals are mainly concentrated in three major categories: theme and content, design and creativity, and space and environment. Furthermore, by further applying the AHP method, the concepts of regional characteristics, natural environment, living scenes, theme creativity, cultural heritage, and craftsmanship are ranked higher in demand. Based on the above findings, this study also proposes relevant improvement suggestions and design ideas, including diversified thematic creativity of murals, cultural tourism development, community participation and co-construction. The study emphasizes the exploration and inheritance of rural culture and human landscapes by designers, broadening the design thinking of designers, and promoting the development of rural mural art, providing cultural support and driving force for rural revitalization. These findings are expected to provide substantive guidance for the practice of rural mural design, and valuable references and inspirations for academia and practitioners.

Keyword

Rural Revitalization(농촌 재생), Mural(벽화), Design Research(디자인 연구)

요약

본 연구는 중국 농촌 벽화 디자인에 대한 사용자 수요를 탐구하고, 농촌의 아름다움을 증진하기 위한 제안을 제시하는 것을 목표로 한다. 연구는 질적인 반구조화된 인터뷰와 양적인 계층적 분석 프로세스(AHP)를 결합한 방법론을 채택하여 보다 객관적인 조사를 수행한다. 우선, 인터뷰를 통해 농촌 벽화 개선을 위한 사용자의 제안과 요구사항을 조사하고, 주요 요구사항을 요약하였다. 그 다음, AHP를 활용하여 추출된 주요 요구사항에 가중치를 할당하고 순위를 매겼다. 연구 결과, 농촌 벽화 개선을 위한 사용자의 요구는 주로 주제와 내용, 디자인과 창의성, 공간과 환경 세 가지 주요 범주에 집중되어 있음을 나타낸다. 더불어 AHP 방법을 추가 적용하여 지역 특성, 자연 환경, 생활 장면, 주제 창의성, 문화유산, 공예 기법 등의 개념적 요구사항이 높은 순위를 차지하였다. 이러한 결과를 바탕으로 본 연구는 벽화의 다양한 주제 창의성, 문화 관광 개발, 지역사회 참여 및 공동 건설 등을 포함한 관련 개선 제안과 디자인 아이디어를 제시한다. 이 연구는 디자이너들이 농촌 문화와 인문 지형 등을 탐구하고 계승하는 것을 강조하여 디자이너의 디자인 사고를 확장시키고, 농촌 벽화 예술의 발전을 촉진하며, 농촌 부흥을 위한 문화적 지원과 동력을 제공한다. 이러한 결과는 농촌 벽화 디자인 실천에 구체적인 지침을 제공하고 학계와 실무자들에게 유용한 참고 자료와 영감을 제공할 것으로 기대된다.

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1. Introduction

1-1. Research Background and Objectives

In recent years, the Chinese government has vigorously implemented the rural revitalization strategy, considering rural construction as an integral part of comprehensively building a socialist modernized country¹⁾. The rural revitalization strategy aims to promote rural economic development, improve living conditions for rural residents, and achieve common prosperity between urban and rural areas. The implementation of this policy has brought new development opportunities and challenges to rural China, while also demonstrating the government's attention to and support for rural development²⁾. Diligence suggests that rural revitalization is not merely an issue of economic development but also concerns the inheritance and innovation of rural culture³⁾. WU scholars believe that rural culture, as an important component of traditional Chinese culture, carries rich historical and cultural heritage as well as local characteristics⁴⁾. Therefore, in the process of rural revitalization, how to promote traditional

- 1) Wikipedia.[웹사이트] (2024년 2월 7일) URL: <http://www.zgxczxzz.com>
- 2) Liu Yan Sui, Urban-rural integration and rural revitalization in China's new era. *Journal of Geography*, 2018, 73(04), P.637-650.
- 3) Dili Nayi Duyishan, Exploration of the path of rural cultural development under the perspective of rural revitalization. *Intelligent Agriculture Journal*, 2024, 4(06), P.185-188.
- 4) WU Liwei, Xie Shengli, Rural cultural revitalization under the perspective of cultural governance: value coupling and current situation. *Journal of Huazhong Agricultural University* (Social Science Edition), 2019, (01), P.16-23.

5. Conclusion

6. References

culture and protect the traditional appearance of rural areas has become a focal point of attention for governments at all levels and various sectors of society. Among them, rural murals can not only showcase local historical culture and folk customs but also inspire residents' cultural confidence and sense of identity, promoting the inheritance and innovation of rural culture⁵⁾. As a form of rural cultural construction, rural murals are also considered to have great potential in shaping the rural image, promoting rural cultural heritage, and attracting tourists due to their intuitive and expressive characteristics⁶⁾. HU explored the "nostalgic culture" value embedded in the social, historical, and pastoral landscape of the Shandong Canal rural area, proposing the "Six Combinations" principle and applying it to rural mural design⁷⁾. FANG conducted an in-depth analysis and discussion using Changfang Village in Chaohu City as an example, concluding that artistic murals play a crucial role in the construction of beautiful rural areas⁸⁾. In

- 5) Koster R L P. Mural-based tourism as a strategy for rural community economic development//Advances in culture, tourism and hospitality research. Emerald Group Publishing Limited, 2008, (2), P.153-292.
- 6) Li Yuanyuan, Luo Junbo. The use of wall painting art and traditional cultural design elements in the construction of beautiful countryside. *Art View*, 2023, (35), P.55-57.
- 7) Hu Jianhua. Wall Painting Art in Shandong Canal Countryside and the Value Construction of "Nostalgia Culture"[J]. *Journal of Culture*, 2020, (11), P.62-65.
- 8) FANG Chunzheng, NI Yan, LING Min. Analyzing the art wall painting in the construction of beautiful countryside--Taking Changfang Village

summary, many scholars have explored rural mural design, but there are currently some issues with its implementation. Firstly, there is a lack of overall planning, and secondly, there is insufficient integration with local cultural characteristics, which limits its application and development in rural revitalization. Against this background, this study aims to examine the current status, problems, and development trends of rural mural design in China from the perspective of rural revitalization. It proposes design strategies based on the concept of rural revitalization and explores the application paths and effects of various elements of murals in rural revitalization, aiming to provide direction for the future development of rural murals.

1-2. Research Scope and Methods

This study, from a design perspective, primarily focuses on exploring the role and impact of rural mural design in rural revitalization, including its potential effects on promoting rural cultural heritage, community cohesion, and economic development. By investigating the demands and expectations of rural communities for mural design and analyzing existing mural design practices, the study aims to provide practical guidance and policy recommendations for rural revitalization. The research methodology combines literature review, user interviews, and expert evaluation methods. Firstly, through literature review and analysis, the study systematically reviews and analyzes the current research progress, theoretical frameworks, and practical cases of rural mural design in rural revitalization to understand the main achievements and shortcomings of existing research. Secondly, through user interviews, the study investigates the opinions, demands, and suggestions of rural residents, cultural workers, designers, and other relevant groups to obtain practical insights and social feedback on rural

in Chaohu City as an example. *Tomorrow Style*, 2019, (11), P.57–59.

mural design. Finally, the Analytic Hierarchy Process (AHP) is employed to analyze the collected data, and expert evaluations are used to determine the relative importance of various criteria elements in rural mural design, providing a basis for the formulation of subsequent design strategies. Through this in-depth research, we hope to provide theoretical support and practical guidance for the application of rural mural design in rural revitalization, promoting sustainable development and cultural prosperity in rural communities.

2. Theoretical Investigation

2-1. Rustic Wall Painting Related Research

Checking the relevant government documents, we found that policy support and measures to strengthen the creation and inheritance of rural culture and art were proposed in the four documents, namely the Guidance Opinions on Carrying Out Pilot Work of Rural Culture Revitalization, the Strategic Plan for Rural Revitalization, the Guidance Opinions on Strengthening Rural Cultural and Artistic Creation and Inheritance, and the Law on the Promotion of Cultural Industries, which considers that cultural and artistic projects such as rural wall painting are also considered as the cultural industry's Part of the cultural industry. Based on this big government policy, many scholars have conducted research on rural wall painting. Among Scholar WANG points out that mural art, due to its timeliness, richness, fashionability, and ease of creation, is becoming a new favorite for urban embellishment. It is gradually spreading from cities to rural areas, allowing murals, which were originally reserved for grand public buildings, to come down from their pedestal and become a populist form of mural art expression⁹⁾. Rural mural is an artistic form of creation

9) Wang Fang. Toward wall painting art in cities, communities and villages – a new trend of contemporary wall painting. *Art Observation*, 2019, (11), P.27–29.

typically executed in rural areas, often consisting of artworks painted on walls, houses, or public spaces in rural settings¹⁰⁾. These murals often showcase a diverse range of scenes, characters, flora and fauna elements, as well as patterns and symbols reflecting local culture, traditions, and history¹¹⁾. Song H believes that rural murals are not just artistic creations, but also a means of cultural inheritance and rural development¹²⁾. MA also points out that murals are not only an organic blend of cultural artistic connotations, spiritual strength, and public space environments, but also one of the most direct artistic forms connecting with the times and showcasing regional traditional culture and architectural style¹³⁾. Upon reviewing relevant literature, it is found that current research on rural mural design in the context of rural revitalization in China mainly focuses on exploring different styles and forms of rural mural design, as well as their effectiveness in rural revitalization. Among them, HUANG combines the current development strategy of rural revitalization with the advantages of the digital age, proposing a method of digitally preserving the BaiSha murals to rejuvenate them in the new era¹⁴⁾. ZHANG conducted research on the practical application

of mural art to support rural revitalization and development, exploring the implementation pathways of mural art in rural areas¹⁵⁾. Scholar TANG believes that when rural areas use mural art to create their distinctive features, they should fully explore local stories and culture, and introduce local characteristics adaptively¹⁶⁾. XU believes that mural art plays an important role in inheriting and integrating Chinese culture, excavating and promoting local cultural characteristics, and showcasing modern technology in the context of rural revitalization¹⁷⁾. In terms of artistic expression, CHEN discusses how to integrate various artistic elements such as calligraphy, traditional Chinese painting, comics, and folk art into the design representation of rural cultural walls. He analyzes the visual and artistic value of these artistic elements in cultural walls and proposes strategic approaches for their expression in rural cultural wall design¹⁸⁾. In summary, rural murals serve as vital carriers of rural cultural traditions, conveying rich cultural connotations and historical memories through images and symbols, thus contributing to the inheritance and promotion of local culture. However, current research may lack considerations and guidance for practical applications, resulting in difficulties in effectively applying research findings in actual rural revitalization practices. Furthermore, based on the literature reviewed, rural murals can be categorized into six types, as shown in Table 1.

10) Wong S K S. Painting New Roles and Relationships: A Rural Community Mural Project in China. *International Journal of Social, Political & Community Agendas in the Arts*, 2015, 10(2).

11) Adams M. Understanding Murals Influence on the Community. *Queens University of Charlotte*, 2020.

12) Song H, Mustafa M, Chen S. Value-Creation and Challenges of Public Art Practice in Rural Areas: A Systematic Review. *The Journal of Arts Management, Law, and Society*, 2024, P.1-18.

13) Ma Guoqiang. Ancient for modern use of Shanxi wall painting in the construction of harmonious countryside. *China Fruit Tree*, 2023, (10), P.158-159.

14) HUANG Peiwen, GU Jiayi, KE Yan. Digital development path of Baisha wall painting under the perspective of rural revitalization. *China Market*, 2024, (04), P.183-186.

15) ZHANG Jun, DING Zhan Teng, JI Weimin et al. Research on practical application of helping rural revitalization by wall painting art. *Contemporary Agricultural Machinery*, 2022, (09), P.101-102.

16) Tang Yimei. "Research on the Application of Wall Painting Art in Rural Revitalization Road". *Proceedings of the 2023 Higher Education Research Forum Guilin Sub-Forum*. Ed, 2023, P.609-610.

17) 许建斌, 骆春榕. 乡村振兴视域下墙绘艺术文化建设分析与研究. *新楚文化*, 2024, (01), P.56-58.

18) Chen Lin. Research on the design performance of art elements in rural culture wall. *Footwear Craft and Design*, 2023, 3(11), P.69-71.

The forms of expression can be divided into seven categories, as presented in Table 2.

[Table 1] Primary Types of Murals

Types	Content
Historical Themes	It depicts historical events, heroes, or traditional rural life, reflecting the local historical culture and traditions.
F o l k Traditional Murals	It reflects local folklore, traditional customs, festival activities, etc., often painted during village celebrations or festivals.
S c e n i c Murals	It features natural landscapes, rural scenery, pastoral views, landscape paintings, etc., showcasing the natural beauty of the countryside.
Labor Life Murals	It depicts rural labor scenes, farmers working scenarios, reflecting the hardships and beauty of rural life and agricultural labor.
Abstract Art Murals	It expresses emotions, thoughts, or artistic concepts in an abstract form, often appearing on the walls of public spaces or buildings.
Community Culture Murals	It features local culture, traditional customs, folk festivals, etc., co-created by local residents, reflecting community cultural identity and cohesion.

[Table 2] Types of Mural Representation

Representation Form	Content
Wall painting	Commonly found on the exterior walls or interior spaces of buildings such as homes, schools, and temples.
Floor wall painting	Commonly found in rural courtyards, public squares and other open spaces, usually in the form of painted or colored stone collage.
Rooftop Wall Painting	Commonly found in the top space of rural huts, gazebos, shrines and other buildings.
Three-dimensional wall painting	Using the concave-convex structure of the building or three-dimensional components to draw the wall painting, through the three-dimensional sense of expression to enhance the picture of the three-dimensional effect and artistic expression.
Village Wall Painting	A series of wall paintings are arranged in rural villages or scenic spots to showcase local culture, history and customs.
Public Art	Wall paintings painted on public

Wall Painting	places or public facilities in the countryside are intended to beautify the environment and enhance the quality of life and cultural atmosphere of the residents.
Interactive Wall Painting	Wall paintings made with special materials or technologies allow viewers to participate by touching, moving or interacting with them, enhancing the viewing experience and fun.





2-2. Wall Mural Case Analysis

Based on the above research, it can be understood that there is a diverse range of styles and forms of wall murals in rural China. Overall, as a traditional art form with a long history, rural wall murals not only carry rich cultural connotations but also serve as an important cultural resource in rural revitalization. In order to understand the actual situation of rural wall mural design, this study will select several representative wall mural projects in rural China to analyze in depth the role and significance of wall murals in rural revitalization, explore their impact on local society, economy, and culture. Through the analysis of these cases, it is hoped that some reference and inspiration can be provided for rural wall mural design. Case A is a wall mural scene in rural areas of eastern China. The project aims to create a "fairy tale world" through wall murals to attract tourists and enhance the village's image. The project adopts an extremely exaggerated design style, depicting the roof as a giant book, integrating characters with the fields, and featuring vibrant colors and simple lines, breaking through the limitations of the real world and creating a dreamy atmosphere. When completed, this wall mural attracted many tourists to come and watch, indirectly promoting rural revitalization. Although this wall mural project has achieved some success, it has also raised questions from scholars about whether the wall murals are compatible with local culture and environment. As mentioned by Wong S K S, practicality should be prioritized in mural design, and murals should be able to blend with the local environment and culture, providing practical

assistance for the development of villages and the lives of residents¹⁹⁾. Case B depicts rural landscapes in southwestern China and aims to showcase the natural scenery, agricultural life, and village culture to enhance the village's image and attract tourists. The mural features elements such as green mountains, clear waters, and pastoral scenes, reflecting the pristine ecology and cultural characteristics of the countryside. Realism is employed in this project as it can authentically depict the appearance and life of rural areas, evoking resonance and emotional connections with the audience, thus enhancing the mural's appeal and affinity. Case C aims to showcase the character and features of rural areas through murals, promoting rural culture and enhancing the village's image. Various rural-specific foods, characters, and cultural elements are depicted in this case. The lifelike character images in the mural resonate with the audience, enhancing the sense of identity and cohesion of rural culture. In the future, by further exploring and depicting rural character images, more vivid and representative character images can be created to enrich the content and connotation of murals, thereby enhancing their artistic level and viewing value. Case D aims to showcase the charm of traditional Chinese calligraphy and painting, enhance the village's image, and promote Chinese culture. The mural adopts a simple and elegant design style, depicting various artistic images with traditional Chinese cultural characteristics through ink and smooth lines. However, while the inheritance of traditional culture is an important aspect of mural design, innovation in modern art is equally important. Overall, whether depicting rural landscapes, rural character features, or calligraphy and Chinese painting styles, murals are an effective way of cultural display. They vividly present the local customs and traditions

of rural areas, and inspire cultural pride and cohesion among local residents.

[Table 3] Examples of Chinese Rural Wall Paintings

Numbering	Picture
A	
B	
C	
D	

2-3. AHP-related studies

The Analytic Hierarchy Process (AHP) is a multi-criteria decision-making method proposed by American scholar Thomas L. Saaty as a management and decision-making tool in the

19) Wong S K S. Painting New Roles and Relationships: A Rural Community Mural Project in China. *International Journal of Social, Political & Community Agendas in the Arts*, 2015, 10(2).

early 1970s²⁰⁾. This method is characterized by the use of less quantitative information to mathematize the process of decision-making thinking on the basis of an in-depth study of the nature of complex decision-making problems, the factors affecting them and their intrinsic relationships²¹⁾. The AHP is designed to help decision makers structure their analysis and decision making when faced with complex decision problems, especially when multiple evaluation criteria or factors are present at the same time²²⁾. The basic idea of AHP is to decompose a complex decision problem into a series of simpler sub-problems, then compare and evaluate the relative importance of factors at different levels, and ultimately derive the optimal decision result through synthesis. The basic steps of AHP can be divided into five steps, as shown in Table 4.

[Table 4] AHP Research Steps

Course of events	Content
Establishing Hierarchy Structure	Decompose the decision problem into a number of levels, including the objective level, the guideline level and the program level, and clarify the hierarchical relationship between each level.
Constructing Judgment Matrices	A judgment matrix is constructed based on the results of the two-by-two comparison, where the elements of the matrix indicate the proportion of importance between the elements.
Calculating Weights	The judgment matrix is used to calculate the weights of the elements of each level, and the maximum eigenvalue and its corresponding

20) Darko A, Chan A P C, Ameyaw E E, et al. Review of application of analytic hierarchy process (AHP) in construction. *International journal of construction management*, 2019, 19(5), P.436–452.

21) Wikipedia.[웹사이트] (2024년 3월 4일) URL: <https://zhuanlan.zhihu.com/p/664960025>

22) Al-Harbi K M A S. Application of the AHP in project management. *International journal of project management*, 2001, 19(1), P.19–27.

	eigenvector are solved by the eigenvalue method or eigenvector method to derive the weight vector.
Consistency Check	Compare the consistency indicators of the judgment matrix to determine the level of consistency of each two-by-two comparison in the judgment matrix to ensure the reliability and reasonableness of the judgment matrix.
Comprehensive Evaluation	Based on the weights of the elements at each level and the scores of the programs, a comprehensive assessment and decision-making process is carried out to arrive at the best program or decision.

In the field of design, Analytic Hierarchy Process (AHP) is widely utilized in various decision-making and evaluation processes. It can be employed in product design decisions, material selection, user experience analysis, spatial layout optimization, design concept evaluation, and creative assessment. Through the AHP method, designers can systematically analyze and evaluate different design choices, balance the importance of various design elements, and determine the optimal design solution, thereby enhancing the scientificity and efficiency of design decision-making. Scholar Harputlugil T, in particular, offers a new approach based on the Analytic Hierarchy Process (AHP) - the Multi-Criteria Decision Making (MCDM) method, contributing to research on architectural design evaluation²³⁾. In the study of home-based elderly-friendly seating design, DAI employed AHP to determine the weight of target user needs, providing a certain reference basis for the research and design of elderly-friendly seating series products²⁴⁾. In the research on smart lighting design systems, DING utilized AHP to determine the weight of urban lighting demands, providing a reference basis for subsequent design

23) Harputlugil T. Analytic hierarchy process (AHP) as an assessment approach for architectural design: Case study of architectural design studio. 2018.

24) 戴宇轩, 章彰, 陈宁峰, 唐琳. 基于AHP、QFD与AD的居家适老座椅设计研究. *包装工程*, 2022, 43(20), P.228–236.

development²⁵⁾. Through scholars' research, it has been found that the AHP-based research method provides a more scientifically objective evaluation of designs, making it a primary research method in related studies. In this study, the application of the AHP method in the field of rural wall painting primarily involves systematic evaluation and comparison of different design elements. AHP provides scientific decision support for the planning, design, and implementation of rural wall painting projects, thereby promoting the development and enhancement of rural cultural art.

3. Research Methods

3-1. User requirement acquisition

To obtain user demands and suggestions regarding rural mural painting, this study initially employed semi-structured interviews. This approach allows for flexible exploration within predetermined thematic areas, enabling interviewees to freely express their viewpoints and experiences. It facilitates in-depth exploration and understanding of their thoughts, attitudes, and experiences²⁶⁾. Based on the current research status of rural mural painting, the interview outline includes basic information about the interviewees, relevant suggestions and expectations, and their perceptions of current mural painting. Specifically, it includes the following questions: "1. What is the relationship between rural revitalization and cultural arts? 2. How do you think rural revitalization policies affect the development of local cultural arts? 3. In your rural area, what role has mural painting

played historically? 4. Currently, how is the inheritance and development of rural mural painting? 5. What do you think are the main challenges facing rural mural painting design? 6. How to address the difficulties encountered in the development of rural mural painting? 7. How do you think mural design elements can be better integrated into the process of rural revitalization?" In summary, the basic principle in setting up the questions is to follow the "from easy to difficult" approach, gradually guiding users to start from their overall impressions and slowly express their opinions and expectations. The saturation requirement of Grounded Theory is met when no more effective data can be extracted from new interviewees. This interview adopts a progressive interview approach, meaning that after interviewing one participant, coding and extracting user needs elements are immediately conducted. When new data no longer provide new information or viewpoints, it can be considered saturated. Due to the dispersed geographical locations of the users, this study was conducted through online interviews. A total of 11 users were interviewed, including 6 males and 5 females. Interviewees mainly consisted of rural residents, rural officials, designers, and travelers. The interviews were conducted from February to April 2024. All interviewees gave their permission, and the study adhered to ethical standards. Detailed information about the users can be found in Table 5. According to the requirements of semi-structured interviews, topics were extended and content was expanded based on the interview outline, encouraging respondents to describe and evaluate based on their true feelings.

25) DING Wei, ZHUO Yaqi, HE Sheng, JIN Ziwei. Research on intelligent lighting design system based on AHP and QFD method under the perspective of inclusive design. *Packaging Engineering*, 2023, 44(18), P.436–447.

26) Adeoye-Olatunde O A, Olenik N L. Research and scholarly methods: Semi-structured interviews. *Journal of the american college of clinical pharmacy*, 2021, 4(10), P.1358–1367.

[Table 5] Interviewing Users for Relevant Information

Num ber	Gend er	Age	Educati on	Identity	Area
H1	Femal e	25	Master' s	Traveler	Eastern China
H2	Male	32	Doctora te	Design er	Southwe st China
H3	Femal	48	Junior	Resident	Eastern

	e		high school		China
H4	Male	23	Bachelor's	Traveler	Southwest China
H5	Male	38	Bachelor's	Rural official	Northern China
H6	Female	36	Associate degree	Resident	Eastern China
H7	Male	17	High school	Traveler	Northern China
H8	Female	27	Master's	Designer	Northern China
H9	Male	43	Master's	Rural official	Southwest China
H10	Female	52	High school	Resident	Eastern China
H11	Male	42	Master's	Traveler	Eastern China

To better understand user expectations, it is necessary to organize and summarize the interview data. By categorizing a large amount of data into different categories, we can gain a clearer understanding of the core issues and main points discussed in the interviews, enabling more targeted analysis and discussion in subsequent stages²⁷⁾. In the process of data summarization in this study, all data remained open for discussion among team members, facilitating exploration. Team members analyzed the selected comments textually, labeling them word by word and sentence by sentence. Through repeated comparison and content organization, effective information was gradually summarized and merged. From the organization of the original interview texts, a total of 136 pieces of valid information were obtained. After removing duplicate content and merging conceptually similar ideas, 16 demand concepts were finally derived and summarized into three main categories, as shown in Table 6.

[Table 6] Organizing and Summarizing User Needs

Source material	Preliminary	Categorization
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27) Magaldi D, Berler M. Semi-structured interviews. Encyclopedia of personality and individual differences, 2020, P.4825–4830.

	concept	on
I love art that makes people think, so some wall art with thought-provoking themes or symbolism would be fun.	Theme Creative B1	Design and Creativity A1
Folkloric wall paintings always give me a strong sense of the countryside.	Style Design B2	
I think countryside wall painting should be a blend of traditional culture and modern art.	Cultural integration B3	
Some wall paintings use digital painting process techniques, which I feel allows for both a high degree of refinement and accuracy.	Craft Technique B4	
I'd like to see some wall art designs with multiple layers and dimensionality	Art form B5	
It is possible to show our countryside through wall paintings, so that people know more about our villages and way of life.	Geographical characteristics B6	Theme and content A2
I think rustic wall art should reflect scenes and scenarios from our daily lives.	Life Scene B7	
Early morning fields, flowing streams, and verdant green woods provide a sense of the beauty and serenity of nature.	Natural environment B8	
Emphasis should be placed on reflecting the traditional festivals, folk activities and local customs of our villages	Cultural Heritage B9	
Demonstrate our interest in and support for community co-development and cultural development.	Community Building B10	
The appearance of the building is enriched by colorful and creative designs to make the building more attractive and distinctive.	Building Elevation B11	Space and Environment A3
Beautification of streets through art creation and design	Streetscaping B12	
I think rustic wall art could be a decoration and accent to the square	Plaza Beautification B13	
I think that rural wall painting should be created with public facilities as the object, highlighting the function and practicality of public facilities	Public facilities B14	
We have some characteristic buildings in our village, but they are rather plain in appearance, and I hope that the village wall paintings can inject	Featured Building B15	

new life and vitality into these characteristic buildings		
The farmland fieldscapes in our villages are beautiful, but sometimes lack some color and elements	Agricultural field B16	

3-2. Weight Division Based on Expert Evaluation

3-2-1. Constructing a Hierarchy Structure Model

In the key requirement set, each element has varying degrees of importance. Therefore, constructing the hierarchy model for each element and subsequent analysis can enable designers to work with greater clarity and logic²⁸⁾. This study constructs a hierarchy model based on the conclusions derived from the aforementioned semi-structured interviews. In this model, rural mural design serves as the goal level, three main categories form the criteria level, and initial concepts constitute the sub-criteria level. For this evaluation, six relevant mural designers were invited to compare and rate each criterion and sub-criterion pair. During the pairwise assessment process, experts need to assign weight levels to each element based on their ratings, where the meanings of each score are represented as shown in Table 7.

[Table 7] AHP Scoring Table

Scale	Significance
1	Comparison of two factors of equal importance
3	Comparison of two factors, the former being slightly more important than the latter
5	Comparison of the two factors, with the former being significantly more important than the latter
7	Comparison of two factors, with the former strongly more important than the latter
9	Comparison of two factors, with the former being more extremely important

28) ZIANG ZIANG,XU JIA. Packaging design and evaluation of agricultural specialty products based on AHP and fuzzy model. Packaging Engineering, 2022, 43(06), P.213–219.

	than the latter
2, 4, 6 8	Median of two adjacent factor judgments
The reciprocal of the above values	A two-factor inverse comparison is the inverse of the original comparison value

3-2-2. Calculation of Weight Vector

1. Normalize the matrix using the following formula:

$$\bar{a}_{ij} = a_{ij} / \sum_{j=1}^n a_{ij} (i, j = 1, 2, \dots, n)$$

Where a_{ij} represents the data in the i row and j column of judgment matrix A , and \bar{a}_{ij} represents the data in the i row and j column of the normalized matrix.

2. Sum the elements within the matrix :

$$\bar{w}_i = \sum_{j=1}^n \bar{a}_{ij} (i, j = 1, 2, \dots, n)$$

3: Implement normalization for \bar{w}_i in the above formula:

$$w_i = \bar{w}_i / \sum_{i=1}^n \bar{w}_i (i = 1, 2, \dots, n)$$

Where w_i represents the weight of the i criterion.

4. Compute the largest eigenvalue of the judgment matrix A :

$$\lambda_{\max} = \frac{1}{n} \sum_{i=1}^n \frac{(Aw)_i}{w_i}$$

Where n is the order of the matrix, A is the judgment matrix, w_i is the weight of the i indicator. λ_{\max} is the maximum eigenvalue of the judgment matrix A .

5. Consistency test, for the vector obtained earlier, there are eigenvalues, consistency test, if you can pass the test, it means that the construction of the judgment matrix is reasonable, both the existence of the value of the interpretation. Assuming that CI stands for consistency index, the following is the arithmetic method:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

Through the value of n , it is possible to obtain the value of RI , so as to obtain the consistency ratio, both when the $CR < 0.1$, then the test meets the requirements.

Combining the above calculation method to solve the expert scoring results, the weighted values of each evaluation indicator based on the previous level are calculated using the set average method. Finally, the judgment matrices and weights of each level in the evaluation indicator system are shown in Tables 8-11. The CR values in each group are all calculated to be less than 0.1, proving that the consistency test has been passed.

[Table 8] Criteria Layer Judgment Matrix and Weights

	A1	A2	A3	CR	W
A1	1.0	0.8	1.2	0.035	0.32
A2	1.2	1.0	2.5		0.45
A3	0.85	0.4	1.0		0.23

[Table 9] Judgment Matrix and Weights for A1

	B1	B2	B3	B4	B5	CR	W
B1	1.0	1.7	1.3	2.0	1.3	0.002	0.27
B2	0.6	1.0	0.8	1.4	0.8		0.17
B3	0.8	1.2	1.0	1.7	1.2		0.22
B4	0.5	0.7	0.6	1.0	0.7		0.14
B5	0.7 5	1.2	0.8	1.5	1.0		0.20

[Table 10] Judgment Matrix and Weights for A2

	B6	B7	B8	B9	B10	CR	W
B6	1.0	1.4	1.1	1.6	2.0	0.004	0.27
B7	0.7	1.0	0.8	1.2	1.4		0.19
B8	0.9	1.3	1.0	1.7	1.3		0.23
B9	0.6	0.8	0.6	1.0	1.1		0.16
B10	0.5	0.7	0.8	0.9	1.0		0.15

[Table 11] Judgment Matrix and Weights for A3

	B11	B12	B13	B14	B15	B16	CR	W
B11	1.0	1.1	1.2	1.4	1.3	1.3	0.01	0.20
B12	0.9	1.0	1.1	1.3	1.0	1.2		0.18
B13	0.8 5	0.9	1.0	1.2	1.1	1.1		0.17

B14	0.7	0.8	0.8	1.0	0.8	0.9		0.14
B15	0.8	1.0	0.9	1.2	1.0	1.0		0.16
B16	0.7 5	0.8	0.9	1.1	1.0	1.0		0.15

The weights of each criterion under the sub-criteria layer have been obtained through the above calculations. Since the sub-criteria layer consists of concepts subordinate to each criterion layer, normalization is required to calculate the weight vectors of each evaluation indicator in the sub-criteria layer regarding the target layer. These weight vectors of each evaluation indicator are then ranked accordingly, as shown in Table 12.

[Table 12] Overall Ranking of Various Evaluation Indicators

	A1	A2	A3	Total W	Ranking
B1	0.27			0.086	3
B2	0.17			0.054	8
B3	0.22			0.071	5
B4	0.14			0.045	10
B5	0.20			0.064	7
B6		0.27		0.122	1
B7		0.19		0.086	3
B8		0.23		0.104	2
B9		0.16		0.072	4
B10		0.15		0.068	6
B11			0.20	0.046	9
B12			0.18	0.041	11
B13			0.17	0.039	12
B14			0.14	0.032	15
B15			0.16	0.037	13
B16			0.15	0.035	14

4. Discussion and analysis

This study first explores the role and significance of rural wall paintings in rural revitalization. Through detailed analysis of relevant literature, it examines the specific functions of rural wall paintings in beautifying rural environments, inheriting local cultures, attracting tourists, and promoting rural economic development. It also investigates their actual effects and impacts in different regions and communities, thus comprehensively demonstrating

their importance and value in rural revitalization.

Secondly, the study focuses on innovation and characteristics in rural wall painting design. By conducting interviews with users, three categories of user expectations regarding rural wall paintings were identified: design and creativity, themes and content, and space and environment. These three main categories can be further divided into 16 detailed concepts. To help creators better understand which concepts are the most important, Analytic Hierarchy Process (AHP) was used to assign weights to these 16 concepts. The categories that ranked high among the 16 were B6 (Regional characteristics), B8 (Natural environment), B7 (Scenes of daily life), B1 (Theme creativity), B9 (Cultural heritage), and B4 (Craft techniques), indicating that users' focus primarily lies in the design creativity and thematic content of rural wall paintings, while the location for displaying wall paintings is considered last. In order to better discuss the application of design requirements and principles in practice, especially how to use creative techniques combined with local culture and environmental characteristics during the creation process to produce rural wall paintings with local characteristics and contemporary flavor, creators need to consider it. Based on the experimental conclusions, we will discuss and analyze the following aspects. Combining the research results, several suggestions for the development of rural wall paintings can be summarized as follows:

Firstly, wall mural themes should embody diverse creativity. Diversified thematic creativity is one of the important directions in rural wall mural design, injecting rich cultural connotations and artistic expressions into mural works. Specifically, by exploring local history, traditions, culture, and natural resources, mural artists can create distinctive works that reflect the diversity and unique charm of rural areas. The expansiveness of this creativity is evident in several aspects: Firstly, by integrating folk legends and traditional stories, mural works can inherit and promote local cultural heritage. For

example, scholar ZHOU Y combined the landscape projects of Sanlin Scenic Area in Dongshui Village, Deqing, China, to design mural works from three aspects: landscape beautification, space, and culture²⁹). SUN draws inspiration from the main roads in urban and rural areas, countryside and cultural squares in Zhumadian, Henan Province, showing a different kind of rural wall painting in Zhumadian³⁰). Secondly, drawing on local customs and festivals, wall painting can show the richness and colorfulness of rural life; at the same time, integrating the natural landscape and ecological environment into the design can create a harmonious and pleasant countryside style. In the related research, JIANG scholars also proposed to transform nature under nature, to find innovation in revering history, and to do so by originating from nature, returning to nature, and adhering to people-oriented³¹). In related cases, the Sichuan Fine Arts Institute students of Chongqing Jiulongpo District Yangjiaping Qianye Road, the blue sky and white clouds, green grass, flowers, tree roots, etc., according to the real-life dynamics of the creation of the wall so that the wall has become a beautiful cityscape³²)! Third, through the molding of cultural characters and folk art images, wall painting works can not only enhance the regional characteristics, but also be able to express the understanding of the rural humanities and praise, specific design ideas can be reflected in the integration of traditional cultural elements of the countryside, such as folklore, traditional crafts, festivals and other activities, in order to

29) Zhou Yuan. Research on rural wall painting landscape design. Zhejiang Agriculture and Forestry University, 2020.

30) Sun Jianbo. Shifting the Wind and Changing the Customs. Xi'an Academy of Fine Arts, 2019.

31) JIANG Pei, CHEN Yuan. Urban wall painting design from the perspective of "unity of heaven and man". Urban and Rural Construction, 2013, (11), P.49-51.

32) Wikipedia.[웹사이트] (2024년 2월 19일) URL: https://m.thepaper.cn/baijiahao_20252722

promote the local cultural traditions and folk customs, inheritance of the rural culture³³⁾. Fourth, the integration of modern artistic innovation and elements of the times, wall painting works can show a sense of the times and artistic charm, attracting a wider range of audience groups. To sum up, the expandability of diversified thematic creativity can not only enrich the content and form of rural wall painting, but also promote rural cultural revitalization and tourism development, and bring new vitality and charm to the countryside.

Secondly, in terms of cultural tourism development, rural wall painting has great potential and attraction. As explained in the previous research study, rural wall painting, as a unique form of culture and art, has become one of the important attractions and highlights of rural tourism. Tourists can learn about local history, tradition and culture and feel the charm and characteristics of the countryside by enjoying the wall-painting works. The development and promotion of rural wall painting can not only promote the development of local tourism, but also increase employment opportunities, thus improving the living standards of rural residents. In particular, through the development of wall-painting themed neighborhoods and the holding of wall-painting art festivals and other activities, more tourists can be attracted to visit and experience the area, leading to the prosperity and development of the surrounding business. As scholar Mahon M explores in his research, how the arts offer a wide range of possibilities for engaging in local development activities and shaping local development agendas in diverse and changing rural environments³⁴⁾. Rural wall

painting through continuous improvement and development can also become a platform for cultural exchange and cooperation, thus attracting domestic and foreign artists to the countryside to create, and promote the dissemination and exchange of rural culture. Of course, the most important thing is that the development of rural wall painting needs to be combined with the local natural environment and human resources, pay attention to the protection and inheritance of rural history and culture, and promote the sustainable development of rural tourism. In summary, cultural tourism development is an important direction for the development of rural wall painting, through reasonable planning and effective operation, can achieve the prosperity of rural tourism and rural revitalization goals.

Finally, the research in this study found that community participation and co-construction are crucial to the development of rural wall painting. First, community participation can enhance residents' sense of identity and belonging to the village wall painting project, and stimulate their love and sense of preservation of village culture. Le Dantec C argues that a sense of community participation can also stimulate community residents' responsibility and sense of ownership, so that they can participate more actively in community affairs and public affairs, and jointly participate in the construction and development of the community to promote the sustainable development and prosperity of the community³⁵⁾. In other words, by inviting local residents to participate in wall-painting designs, graffiti activities and other forms, the wall-painted works can be brought closer to local life and culture, better reflecting the characteristics and charm of the countryside. Secondly, community participation and co-construction can also promote the

33) Lovtsova I V, Burovkina L A, Sheshko A S. Preservation of the intangible cultural heritage through the implementation of additional general education programs in the field of fine arts. *Revista Tempos e Espaços em Educação*, 2021, 14(33), P.1–12.

34) Mahon M, Hyyryläinen T. Rural arts festivals as contributors to rural development and resilience. *Sociologia Ruralis*, 2019, 59(4):

612–635.

35) Le Dantec C. Participation and publics: supporting community engagement//*Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 2012, P.1351–1360.

development and progress of rural society and the construction and improvement of the rural governance system. Through the active participation and joint efforts of community residents, the problems and difficulties existing in the rural wall painting project can be solved, and the smooth promotion and implementation of the project can be promoted. Of course, community participation and co-construction requires the participation and support of many parties, such as the government, enterprises and social organizations, to form a synergy and achieve the sustainable development of the rural wall painting project and the goal of community co-construction and sharing. In conclusion, through this study, we have gained a deeper understanding of user demand for rural wall painting, which provides ideas for creators and new methods for wall painting development in rural revitalization. In the future, we can further deepen the research of rural wall painting design, explore more innovative design concepts and technical means to promote the development and application of rural wall painting art. At the same time, we can combine the actual situation and actively carry out practical activities of rural wall painting design to inject more cultural vitality and development momentum for rural revitalization and promote the prosperity and progress of rural communities.

5. Conclusion

This study conducted in-depth research and analysis on rural wall painting design in China from the perspective of rural revitalization, using interview methods and Analytic Hierarchy Process (AHP). Through reviewing relevant literature, it was found that rural wall painting design plays a significant role in promoting rural revitalization. Carefully designed wall paintings can inherit rural culture, boost tourism development, enhance community cohesion, and promote environmental protection and ecological

civilization construction. Furthermore, interviews with experts and local residents revealed important issues and challenges in rural wall painting design, such as difficulties in choosing design themes, selecting materials and techniques, and generating design ideas. Using AHP, key factors of rural wall painting design were evaluated and ranked, providing a scientific basis for design optimization and decision-making. Factors like regional characteristics and natural environment in theme content, and theme creativity and craftsmanship in design ideas were identified as crucial elements influencing the effectiveness of wall painting design. Based on these research findings, recommendations were proposed to deepen the study and practice of rural wall painting design. These recommendations include enhancing the exploration and inheritance of rural culture, diversifying design approaches, extracting unique rural landscapes and humanities as creative materials, etc., to promote the development and application of rural wall painting art, and provide more cultural support and impetus for rural revitalization. Although this study has made some progress, there are still some shortcomings. Specifically, the research mainly focused on the aesthetic value and artistic expression of rural wall painting, lacking in-depth empirical research on its actual impact on promoting rural community development, cultural inheritance, and economic revitalization. In summary, this study systematically investigated and analyzed rural wall painting design in China from the perspective of rural revitalization, providing important references and insights for theoretical research and practical applications in related fields. In future work, we will continue to deepen the research and promote the development of rural wall painting art, injecting more cultural vitality and development momentum into rural revitalization efforts.

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