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Research Article

Analysis of Brand Expectation for Chinese Natural Dyes Based on the Kano Model

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ABSTRACT

This research aimed to study (1) apply the Kano model to deeply analyze consumers' psychological expectations; (2) create designs that are both traditional and modern through the optimization of brand image, to better meet consumer expectations; (3) utilize new knowledge to develop a series of innovative natural dye product designs, the sample was 350 consumers. They were selected by Purposive Sampling, the instrument for collecting data were in-depth interviews and focus groups Analysis data by Descriptive statistics and Content Analysis. The research results were found as follows; 1) The consumers demonstrate multi-layered psychological expectations for natural dye brands, not only encompass respect for traditional culture and support for environmental concepts but also include the pursuit of fashionable design. 2) The natural dye brand design and development process based on the Kano model, aimed at accurately capturing and fulfilling the diversity of consumer expectations. Notably, up to 90% of experts and respondents agree with the brand positioning based on the Kano model. 3) Utilizing new knowledge to develop a series of innovative natural dye product designs. —maintains the continuity of traditional natural dyeing, successfully promotes market transformation by integrating traditional craftsmanship with modern fashion innovation, especially rekindling interest in traditional natural dyes among young consumers.

1. Introduction

With the increasing focus on the natural environment and the pursuit of a green, healthy life cultural exchange. Within China's inventory of intangible cultural heritage representative projects, traditional crafts account for 629 items, yet traditional printing and dyeing techniques comprise only 14 items (Kuili, 2007). a rather modest proportion for a country with a rich textile history. The transformation and evolution of China's apparel industry and the changing consumer structure (Xin et al., 2020), traditional imitative and homogeneous consumption patterns can no longer meet the growing demand for personalized and diversified clothing choices. The factors driving apparel consumption have shifted from mere practicality to a combination of valuing personal worth, expressing individuality, and showcasing diverse aesthetics (Weiming & Yanghong, 2018).

The researcher who is study of faculty of decorative arts considerate from a design perspective, how to meet or exceed customer expectations using the Kano model, establish a unique brand positioning in the market, while emphasizing the cultural transmission of natural dye products through innovative design thinking, and avoiding the issue of product homogenization, becomes a new driving force and direction for the inheritance and development of this ancient craft (Xu et al., 2009).

Given this context, to analyze how traditional natural dyeing can more precisely meet the expectations of modern consumers, this study employs a comprehensive approach using various research methods such as in-depth interviews and surveys to identify five dimensions of consumer expectations for Chinese traditional natural dye products.(Chen and Chuang, 2008) On this basis, the Kano model is utilized to classify consumer expectation attributes and explore satisfaction and importance levels, employing a quantitative ranking method in hopes of providing references for theoretical research on traditional natural dyeing, skill inheritance, and brand product design and innovation.

2. Research Objectives

1. Apply the Kano model to deeply analyze consumers' psychological expectations;
2. Create designs that are both traditional and modern through the optimization of brand image, to better meet consumer expectations;
3. Utilize new knowledge to develop a series of innovative natural dye product designs

3. Conceptual Framework

In the constantly evolving market, consumer expectations of brands are continuously changing. how the Kano model is used to understand the specific expectations consumers have of brands and to find a design approach that combines traditional craftsmanship with innovation. This method is crucial for the strategic planning and product design of brands, The details are as follows Figure 1 details:

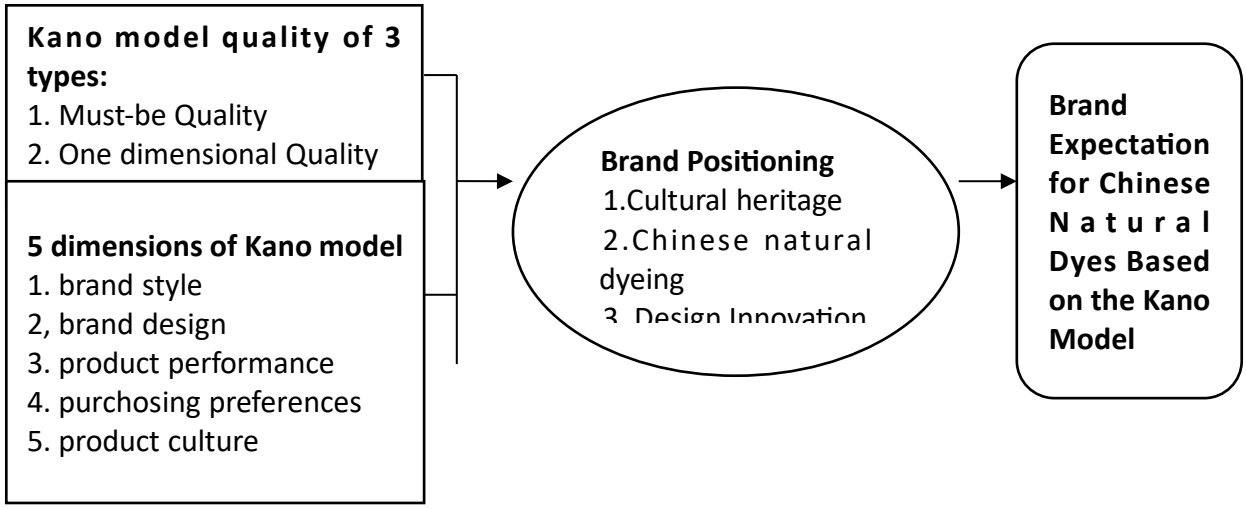

Fig.1 Conceptual Framework

4. Research Methodology

The study employed a mixed-method approach, combining qualitative and quantitative research methods (Walliman, 2021).

4.1. Population and sampling

4.1.1 Population

The population of the study were 4,000 consumers

4.1.2 Sample

By purposive sampling—qualitative research: we conducted an in-depth interview the professionals 3 persons in the field of natural dye research and education more than four years longitudinal study who were Yan Can, Zou Liulan, and Yin Jing.

Quantitative research: we conducted by determine the sample size by using the table of Krejcie & Morgan (1970) composed of 350 consumers.

4.2. Research Instrument

4.2.1. Used the questionnaire consists of 2 parts— (1) Demographic data of correspondents used checklist (2) The basic situation survey of user expectations in brand style, brand design, product performance, purchasing preferences, and product culture within the rating scale of 5 to 1—the rating scale of 5 to 1 refer to the user expectations for target product as follows;

5 = the highest level of user expectations

4 = the high level of user expectations

3 = the moderate level of user expectations

2 = the low level of user expectations

1 = the lowest level of user expectations

2. in-depth interview

4.3. Data collection

The researcher collects tallies the questionnaire data from the questionable and summarizes the data for further analysis. And Self-contained interviews and notes.

4.4. Data Analysis

This model helps in identifying different levels of user expectations for target product functions, clarifying key design directions, and developing products with a strong purpose, thereby enhancing customer loyalty.

Mean interval

4.21-5.0 Mean interval the highest level of user expectations
3.81-4.20 Mean interval the high level of user expectations
3.01-3.80 Mean interval the moderate level of user expectations
2.01-3.0 Mean interval the low level of user expectations
0.51-2.0 Mean interval the lowest level of user expectations

Research Results

1. Apply the Kano model to deeply analyze consumers' psychological expectations;

The results showed that part 1-part 6

Part 1: Mean of Dimensional analysis of Kano model value 4.10, SD=0.43 was high level.
Part 2: Mean of Indifferent quality value 3.33 D=0.31 was high level.
Part 3: Mean of Different Types of Needs SD=0.349 was high level.
Part 4: Ranking of Different Types of Expectations
Part 5: Ranking of the Importance of Different Requirement Dimensions

Part 1 Dimensional analysis of Kano model

Table 1 Dimensional analysis of Kano model

Dimensional analysis of Kano model				
	Mean		SD	VERBAL INTERPRETATION
1	Brand style	4.19	0.44	High
2	Brand design	3.90	0.41	High
3	Product performance	4.10	0.43	High
4	Purchasing preferences	4.18	0.44	High
5	product culture	4.11	0.43	High
	Total	**4.10**	**0.43**	**High**

Mean of Dimensional analysis of Kano model value 4.10, SD=0.43 was high level.

Part 2 Kano questionnaire analysis

Table 2 Kano questionnaire

Problem setting		**Direct problem**			
	Must	**Like**	**Indifferent**	**Dislike**	**Detest**
1	**Q**	**A**	**A**	**A**	**O**
2	**R**	**I**	**I**	**I**	**M**
3	**R**	**I**	**I**	**I**	**M**
4	**R**	**I**	**I**	**I**	**M**
5	**R**	**R**	**R**	**R**	**Q**
Total	**R**	**I**	**I**	**I**	**M**
3.33	**4.0**	**3.0**	**3.0**	**3.0**	**3.0**

Note. Must-be Quality (M), One-dimensional Quality (O), Attractive Quality (A), Indifferent Quality (I), and
Reverse Quality (R).

Part 3 Mean of Different Types of Needs SD=0.349 was high level.

Table 3 Statistics and Classification of Different Types of Expectations

	Attractive Expectations	Basic Expectations	Performance Expectations	Indifferent Expectation	Reverse Expectations	Questionable Results	Better Value	Worse Value	Better-Worse Classification
	A	M	O	I	R	Q			
A1	32	13	9	71	2	0	0.328	0.176	Basic Expectations
A2	35	11	8	70	2	1	0.347	0.153	Indifferent Expectations
A3	32	12	11	70	1	1	0.344	0.184	Basic Expectations
A4	34	20	10	62	1	0	0.349	0.238	Performance Expectations
A5	36	10	9	69	3	0	0.363	0.153	Attractive Expectations
A6	45	8	5	66	2	1	0.403	0.105	Attractive Expectations
A7	46	9	12	57	3	0	0.468	0.169	Performance Expectations
B8	29	16	10	69	3	0	0.315	0.210	Basic Expectations
B9	26	14	13	72	1	1	0.312	0.216	Basic Expectations
B10	24	20	6	77	0	0	0.236	0.205	Basic Expectations

	Attractive Expectations A	Basic Expectations M	Performance Expectations O	Indifferent Expectation I	Reverse Expectations R	Questionable Results Q	Better Value	Worse Value	Better-Worse Classification
B11	34	11	12	65	4	1	0.377	0.189	Performance Expectations
B12	27	20	5	74	1	0	0.254	0.198	Basic Expectations
B13	34	18	4	67	4	0	0.309	0.179	Basic Expectations
C14	36	13	14	62	2	0	0.400	0.216	Performance Expectations
C15	37	8	11	70	1	0	0.381	0.151	Attractive Expectations
C16	41	10	6	70	0	0	0.370	0.126	Attractive Expectations
C17	41	12	7	65	2	0	0.384	0.152	Attractive Expectations
D18	35	17	6	65	4	0	0.333	0.187	Basic Expectations
D19	41	7	6	70	3	0	0.379	0.105	Attractive Expectations
D20	22	18	13	74	0	0	0.276	0.244	Basic Expectations
D21	41	15	8	59	4	0	0.398	0.187	Performance Expectations
D22	40	10	8	69	0	0	0.378	0.142	Attractive Expectations
D23	33	15	9	69	1	0	0.333	0.190	Basic Expectations
E24	39	6	5	76	1	0	0.349	0.087	Attractive Expectations
E25	39	10	6	71	1	0	0.357	0.127	Attractive Expectations
E26	34	7	6	79	1	0	0.317	0.103	Indifferent Expectations
E27	38	6	6	76	1	0	0.349	0.095	Attractive Expectations
E28	35	19	9	62	2	0	0.352	0.224	Performance Expectations
			Total				0.349	0.168	

Part 4: Ranking of Different Types of Expectations

Table 4 The Importance Ranking of Different Types of Expectations

Type of Need	Importance Ranking
Expected Needs	A7>C14>D21>A4>B11>E28
Attractive Needs	A3>D23>D18>B9>B8>A1>D20>B13>B12>B10
Indifferent Needs	A2>E26
Must-Have Needs	A6>C17>C15>D22>A5>D19>C16>E25>E27>E24

Part 5: Ranking of the Importance of Different Requirement Dimensions

Table 5 The Importance Ranking of Different Dimensions of Expectations

Expectations Dimension	Importance Ranking
Brand Style Expectations	A7>A4>A6>A5>A3>A2>A1
Brand Design Expectations	B11>B9>B8>B13>B12>B10
Product Performance Expectations	C14>C17>C15>C16
Purchase Preference Expectations	D21>D22>D19>D23>D18>D20
Product Culture Expectations	E28>E25>E27>E24>E26

Expectations Sensitivity Analysis.

Based on the quadrant classification, sensitivity is used as the indicator for prioritizing the order of requirements. The sensitivity calculation formula is (Ying et al., 2023) :

According to the calculation results, among all the indicators, A7 Artistic Appeal ranks first in priority, followed by C14 Eco-friendly and Sustainable, D21 Online Virtual Display and Purchase Channels. The priorities of E26 Brand Marketing Culture, B12 Mass Production, and B10 Ethnic Style rank the lowest.

4.4. The results showed that Brand Design Expectations

The key points of brand design requirements primarily include B8, B9, and B11, in establishing the Chinese plant-based dye brand "XiaMu," with a focus on conveying brand philosophy and style, and building a clear and consistent brand image in the market.

B8 (Color Requirements): Natural plant dyes impart gentle gradient colors to clothing, reflecting respect for nature. Color design emphasizes the harmony of nature and cultural symbolism, blending traditional Chinese colors. Through innovative color transitions and layering combinations, it showcases the delicate and versatile nature of plant-based dyeing, making the products uniquely captivating.

B9 (Handcrafted): Emphasis on the value of craftsmanship, preserving and innovating traditional techniques. Combining modern technology to optimize the dyeing process, enhancing color stability and durability. Prioritizing the fusion of traditional craftsmanship with modern design, such as incorporating popular elements into clothing tailoring, revitalizing traditional craftsmanship in the context of contemporary fashion.

B11 (Traditional Dyeing Techniques): XiaRan utilizes traditional plant-based dyeing techniques, placing importance on the preservation and inheritance of these techniques, emphasizing their application in modern design. Combining ancient tie-dye and resist-dyeing techniques with contemporary design to create traditional clothing that aligns with modern aesthetics. Additionally, exploring the application of dyes on various fabrics and combining different materials to expand product diversity and uniqueness.

Product Performance Expectations

The key points of product performance requirements primarily include C14 and C15, and through the in-depth development of product performance, they convey the brand's commitment to environmental sustainability, health, comfort, and innovation.

C14 (Eco-friendly and Sustainable): XiaRan uses natural and renewable materials, emphasizing environmental friendliness and sustainability. Every production stage is dedicated to minimizing environmental impact, with plant-based dye materials that are safe and healthy, friendly to both producers and users.

C15 (Health and Functional Benefits): XiaRan products offer health benefits, with indigo plant-based dyes having antibacterial, anti-inflammatory, and hypoallergenic properties, making them suitable for sensitive skin. Emphasis is placed on breathable and comfortable fabrics, which are beneficial for stress relief and enhance the value of wearing in terms of health.

Purchasing Preference Expectations

The key points of purchasing preference requirements mainly include D21 and D22. By analyzing consumer purchasing preference expectations and strategies, XiaMu can better meet the diverse needs of modern consumers.

D21 (Online Virtual Display and Purchase Channels): On online platforms, XiaRan provides a convenient shopping experience and 3D virtual simulation CLO digital fashion displays, enhancing immersive interactive shopping. Consumers can intuitively understand product styles, effects, and textures.

D22 (Offline Product Try-on and Exhibitions): Brand experience stores and exhibitions not only sell products but also showcase brand culture. They provide interactive experiences related to plant-based dye culture and craftsmanship, such as on-site dyeing and hands-on workshops. These activities enhance customer loyalty, boost word-of-mouth marketing, and strengthen the brand's interactive experience with customers.

Product Cultural Expectations

The key points of product cultural expectations primarily include E25 and E28. XiaMu is committed to enhancing consumer aesthetics, inheriting Chinese plant-based dyeing culture, and actively fulfilling social responsibilities and sustainable development, thereby enhancing brand cultural content and market competitiveness.

E25 (Aesthetic Enhancement): XiaRan enhances consumer aesthetics through unique design and artistic expression, leading fashion and art trends, and conveying the philosophy of cultural living. It regularly releases content related to traditional Chinese culture and collaborates with artists on series, such as the history of plant-based dyeing, to educate and inspire consumers, thereby enhancing cultural literacy and aesthetic values.

E28 (Cultural Dissemination and Heritage): As both a brand and cultural carrier, XiaRan is dedicated to spreading and inheriting the Chinese plant-based dyeing technique, allowing more people to appreciate this cultural heritage. By showcasing its aesthetics and craftsmanship, it inspires interest and respect for traditional culture, promotes related design and educational research, and fosters artistic heritage and development

4.5. Utilize new knowledge to develop a series of innovative natural dye product designs — showed that utilizing new knowledge to develop a series of innovative natural dye product designs. — maintains the continuity of traditional natural dyeing, successfully promotes market transformation by integrating traditional craftsmanship with modern fashion innovation, especially rekindling interest in traditional natural dyes among young consumers.

5. Discussions

5.1. Tradition and Innovation—by conducting an in-depth analysis of consumer expectations for Chinese natural dye brands through the Kano model, a unique brand identity is formed. The results indicate that the Kano model can effectively position the brand and guide product design. Through the Better-Worse coefficient and the four-quadrant method, the brand's style, design, performance, and culture are comprehensively positioned. This provides empirical support for brand research and offers profound insights for the strategic planning and design of natural dye brands, reflecting an innovative integration of tradition and modernity.

5.2. Challenges and Constraints—the Kano model is typically based on one-time surveys, but consumer needs and preferences can change over time with market trends, and the model may not capture these dynamic shifts. Balancing the preservation of traditional craftsmanship while incorporating modern design and innovation is a challenge.

Finding the equilibrium point between tradition and modernity, preserving the charm of tradition while meeting the expectations of modern consumers, requires careful strategy and innovative approaches. These challenges and constraints pose questions for plant-based dyeing brands in their practical operations and market positioning. Understanding and addressing these challenges are crucial to ensuring the effectiveness of research outcomes and brand success.

6. Conclusion

Impact on Brand Positioning

The purpose of this study is to analyze the expectations of natural dye brand users using the Kano model, providing a strong reference for brand design. Through the data analysis of 327 valid samples, a sensitivity analysis of customer expectations is conducted, comparing and ranking the importance of different expectation attributes and dimensions. Ultimately, the study precisely positions the Chinese natural dye brand "XiaRan," which integrates traditional craftsmanship with modern elements.

Impact on Design Innovation

Exploring the design innovation potential of natural dyeing, centered around the five expectations of brand users, has led to the creation of the "XiaRan" series of fashion and accessory products, signifying the possibility of reviving traditional skills with contemporary design concepts. The establishment of online virtual fashion shows and offline brand experience exhibitions has paved a new path for the protection and development of traditional natural dyeing cultural skills. This study successfully demonstrates the delicate balance between customer demand and product innovation for natural dyeing, achieving its goals and making significant contributions to traditional crafts and modern design, impacting the fields of design research and cultural heritage protection.

7. Suggestions

7.1. Recommendation for Implementing the research finding

7.1.1 It is recommended that "XiaRan" conducts continuous market and consumer trend monitoring.

7.1.2 Regularly updating customer expectation analyses to capture changes in psychological expectations.

7.1.3 Utilize data analysis and social media monitoring to understand the market in real-time,

7.1.4 Actively listening to consumer feedback to improve product services.

7.2. Suggestions for future research

7.2.1 The research on Establish a sustainable innovation platform for developing collaborative among Artisans, designers, and researchers.

7.2.2 Future research should further explore to Enhance public awareness of the environmental friendliness and sustainability of natural dyeing through education and marketing strategies.

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