Quest Journals

Journal of Research in Environmental and Earth Sciences

Volume 8 ~ Issue 9 (2022) pp: 81-90

ISSN(Online):2348-2532 www.questjournals.org



Research Paper

Bamboo product design and countermeasures research

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ABSTRACT: Traditional bamboo weaving is an important intangible cultural heritage in China, and bamboo products are an important part of traditional people's life and production. However, with the development of social economy, a large number of industrial products have replaced the use of bamboo woven products, making them gradually declining. The fundamental reason is that the traditional bamboo weaving process has not been able to make appropriate changes in modern society, and the functions and forms of traditional bamboo products no longer fit the modern lifestyle and aesthetic tendencies. There is an infinite wisdom and culture behind bamboo weaving that is worth exploring and learning. However, in the era of modern industrial development, traditional bamboo weaving is declining as tradition and modernity collide and merge. In this paper, we analyze the history and characteristics of bamboo weaving, understand the origin and development of bamboo weaving, and use "redesign" to compare and analyze the types, shapes, colors, and decorations of traditional bamboo weaving products with modern bamboo weaving products, as well as the case study of traditional bamboo weaving redesign, to summarize the feasibility and value of bamboo weaving in today's society. The project aims to develop the viability and value of bamboo weaving in today's society, and to bring new vitality and vigor to bamboo weaving. Therefore, the theme of this research is to bring traditional bamboo weaving back to modern life through "redesign" and to adapt to the modern diversified market development, which is also a topic of great social

KEYWORDS: Bamboo woven products; Industrial design; Design principles; Innovative design

Received 02 Sep, 2022; Revised 14 Sep., 2022; Accepted 16 Sep., 2022 © The author(s) 2022. Published with open access at www.questjurnals.org

I. INTRODUCTION

Traditional plant weaving has played an important role in the life and production of our people for thousands of years. However, after entering the industrial era, with the rapid development of social productivity, a large number of modern industrial products have replaced the bamboo woven living apparatus, the traditional bamboo weaving industry has suffered certain impact, the entire market has become increasingly weak, craftsmen can no longer rely on their craft or livelihood security, the traditional plant weaving industry has fallen into the "small scale, low income, no heritage The traditional plant weaving industry has fallen into the state of "small scale, low income and no inheritance". Since the mass production of modern industrialization, a large number of bulks, cold industrial products are flooding around us, accompanied by the gradual disappearance of more and more traditional handicrafts. The irreplaceable nature of traditional handmade items is revealed by the craftsman's gratitude for materials and nature, and the ingenious conception of each product with a unique handmade temperature, which is what is missing in modern industrial products, so let the traditional bamboo weaving craft return to contemporary life to meet people's expectations.

Traditional bamboo weaving belongs to the category of traditional handicrafts, and the methods and paths of innovative design for traditional handicrafts have commonality. In recent years, research on traditional handicrafts has been done all over the world. In terms of theoretical research, Japanese designer Toshiyuki Kita^[1] wrote "Giving Design a Soul: When Modern Design Meets Traditional Crafts", a detailed record of the process of integrating Japanese industrial design with traditional crafts, summarizing the experience and wisdom of combining local crafts with modern design and moving from local to global. Yang Wangying^[2], in "Exploring the Innovative Design of Modern Bamboo Woven Living Apparatus", proposed the use of modern living needs as the guide, modern living aesthetics as the guide, and Yang Wangying^[2] proposed three directions for the innovation of traditional handicraft products, namely, modern life needs, modern life aesthetics, and integration of modern technology. The book "The Art of Chinese Bamboo Weaving" by Xu Huadang^[3] is the most complete analysis of bamboo weaving products, which collects more than 500 bamboo weaving works in total, classifies bamboo weaving, and provides a large number of pictures for bamboo weaving research. Shen Min's [4] "Traditional Chinese Bamboo Weaving", on the other hand, classifies the history of bamboo weaving and different years of bamboo weaving, and has a clear definition in the era of bamboo weaving, which is very helpful for the study of the history of bamboo weaving. By analyzing the characteristics of bamboo weaving and handmade leather goods in western Hunan, Huang Weijia et al.^[5] figured out the strategy of integrating bamboo weaving and handmade leather to adapt to the development of modern life while preserving traditional handicrafts and their culture. The design practice of cultural and creative products of bamboo weaving and leather goods provides implications for the living heritage of bamboo weaving. Jing Fangfang [6] Bamboo products have an important position in traditional Chinese culture. Entering a new historical stage, China's economic and social development in all aspects, the demand for bamboo material products at all levels has increased significantly. The design of traditional bamboo artifacts has been analyzed from different perspectives, the corresponding design principles have been introduced, and then the design of bamboo material products in modern society has been explored [7-10].

In general, the current status of innovative design of bamboo derivatives is under-researched in academia, and there is a lack of research on bamboo derivative design methods and design theories. This paper expands the research field of bamboo derivatives on the basis of the previous exploration of the development history, craft production and design of bamboo weaving, enriching its research content and adapting to the diversified market development.

II. BAMBOO WEAVING PRODUCTS OVERVIEW

2.1 THE BASIC PRINCIPLES OF BAMBOO PRODUCT DESIGN

In the long history, bamboo weaving craft has always accompanied the production life of working people, is an indispensable category of products in people's daily life, bamboo products are produced to meet the various needs of people in daily production life, it is a functional product arising from the different needs of people. For bamboo materials, no matter what kind of products are manufactured, they need scientific design to support. Especially in the modern society, people's needs are more personalized and artistic. Only through continuous design innovation can bamboo materials be better applied and bamboo products reflect more connotations, thus meeting consumers' spiritual and functional needs in a deeper way [11-13].

Bamboo weave used in the section of all rectangular, in the thickness of the thickness are strict requirements, the thickness of only one or two hairs thick, the width of only four or five hairs wide, the root of the bamboo is through the uniform knife, to achieve uniform thickness, thickness and consistency, the viewer does not praise its difficulty. Traditional bamboo weaving has a long history and is rich in the crystallization of the hard work of working people. Different styles of bamboo weaving works are exhibited in the traditional skill block, including the long history and skillful Qing Shen bamboo weaving, and Liu's bamboo weaving, which combines modern fashion with traditional Chinese cultural craftsmanship, and draws on the strengths of all.

2.2 CLASSIFICATION OF BAMBOO WOVEN PRODUCTS

Bamboo woven products can be classified into fine silk crafts and coarse silk bamboo crafts according to different processes. The finished product is mainly made by cutting, scraping, polishing, splitting and other processes of bamboo, which is cut into certain thickness of gabions and knitted together.



Fig. 1 Bamboo box on porcelain

Fine silk bamboo weaving process is also called porcelain bamboo weaving process. The products are mainly divided into six categories, such as vases, altars, bags, boxes, utensils and paintings. Vases are available in different sizes to suit the needs of different occasions. The altar and jar category has tea cups, sugar jars, tea jars and other practical items (**Fig. 1**). Bamboo bag category has two categories of six specifications of bamboo bags handbags and satchels. There are many different styles of bamboo weaving plane painting (**Fig. 2**). The technique of bamboo weaving on porcelain is unique and distinguished by its fineness, featuring the techniques of "selected materials, extra-fine silk, tightly fitted tires, dense hidden heads, and colorful pictures". In the process of making bamboo weaving, all the bamboo threads are handwoven by hand with a knife, so that they are shaped according to the tires and fit closely to the porcelain surface, and all the joints are hidden, as if they are naturally generated and integrated. The factory has developed new products such as bamboo jewelry boxes, bamboo bags, and bamboo animals by transplanting the technique of bamboo weaving on porcelain to other products with bottom tires and without tires [13-15].

Rough silk bamboo weaving is also known as non-porcelain bamboo weaving. The products include bamboo mats, pillows, fans, wicker, baskets, baskets, skips, cradles, etc. This process refers to the bamboo weaving process that uses bamboo gabions to weave household utensils and ornamental furnishings. The process is to cut the bamboo into thin and thick gabions, and after the process of cutting, scraping, polishing and splitting, they are knitted into a variety of delicate daily necessities, such as bamboo baskets, fruit boxes, screens, curtains, fans and so on [16].



Fig. 2 Bamboo painting on porcelain

Bamboo woven products can also be divided into three categories according to the function: living apparatus, production apparatus and handicrafts. Living apparatus is an important part of traditional bamboo woven products, which is closely related to people's daily life, and it is mainly produced to meet people's needs in clothing, food, housing and transportation. Production utensils, which are used for processing objects in the course of daily labor, can be divided into two categories: farming utensils and hand-made utensils. Traditional bamboo crafts: Compared with bamboo living and production utensils, bamboo crafts are produced more to bring spiritual satisfaction to the maker and the user, it is a class of traditional people's daily production life, but at the same time away from the specific use of the function of the apparatus products, from the form of bamboo crafts can be divided into two categories: three-dimensional bamboo weaving and flat bamboo weaving.

2.3 THE MAIN ROLE OF BAMBOO WOVEN PRODUCTS

Traditional bamboo products are made for the purpose of use, and craftsmen must first grasp the function and use of the products. The idea is that "practicality is the first purpose".

Bamboo products are tools with function as the core. Compared with other traditional handicrafts that are mainly appreciated, the shape of bamboo products are mostly simple geometric shapes built on top of the practical function of the object, and many traditional bamboo products can be seen in their function as the core of the modeling idea, such as the fish basket used to hold fish when fishing, the fish basket shape has a large body, in order to make it have a large holding space, the area of the mouth of the fish basket is relatively small compared to its holding The area of the mouth of the fish trap is relatively small compared to the space it holds, and the design of the traditional fish trap is to avoid the fish caught from the fish trap jumping out, and the shape of the traditional bamboo fish trap can well meet the functional needs of the fish [17].

Bamboo woven products are artifacts that focus on the combination of form and function. Compared with modern materials, bamboo itself has excellent properties such as flexibility and coolness, and its special production techniques make traditional bamboo products have both unique forms and functional properties. The design of Lady Bamboo is to adopt the cool and permeable characteristics of bamboo material to achieve the function of cooling and ventilation. However, both the old image of Lady Bamboo and its traditional use are no longer suitable for the modern home environment. Therefore, in modern life, the redesign of the traditional image of bamboo woven products, Lady Bamboo, is necessary.

Bamboo woven products are crafts that adhere to the development of innovation. Today, with the development of technological materials, the performance of various materials has been more and more profoundly understood. Of course, in the process of combining bamboo with other materials may bring some morphological style conflicts, disharmony, the need to explore the possibility of combining bamboo with other materials, study the structure of its shape when connected, and strive to create a bamboo woven design in line with modern aesthetics. For example, the color of bamboo woven lamps and lanterns is divided into bamboo natural color and bamboo color change, the natural color includes green and yellow. Bamboo color change contains two processes, that is, bamboo carbonization and bamboo bleaching; bamboo after carbonization is black, bamboo after bleaching is white. Or cross-weave different colors to bring different visual effect and emotional experience.

2.4 EVALUATION INDEX OF BAMBOO PRODUCT DESIGN

To judge whether a product is perfect or not, we should consider the aesthetic, technical, human-machine, environmental and economic factors of the product. In order to be able to get accurate, scientific and fair evaluation results, combined with the characteristics of product form design, the construction of product shape design evaluation index system needs to follow the following basic guidelines [18].

The criterion of combining with the aesthetic law. The combination of evaluation indexes and aesthetic laws can audit the aesthetics of the shape with full consideration of the characteristics of the times and reflect the essence and laws of beauty of product design.

The criterion of combining with product attributes. The evaluation index system should cover all the elements affecting the product as much as possible in order to fully describe the product characteristics in detail, including the demand elements of the product, consumer characteristics, market competition, product grade, channel characteristics, social attributes, safety attributes, legal policies, etc.

Guidelines for combining design objectives. The evaluation index system based on product design objectives can change with the changes in consumer demand, and under the premise of meeting the product design objectives, the qualified design solutions that are satisfied by users and accepted by the market are screened.

The criterion of combining with the trend of the times of product design. Product form design under the influence of social and economic factors, with a clear brand of the times. Such as the popular

rococo design in the 1820s, the current low-carbon environmental design concept popular with the deterioration of energy consumption and living environment, etc. Combining the characteristics of the times and future development trends, it is important to establish a product design evaluation index system that responds to the characteristics of the times.

III. ANALYSIS OF BAMBOO PRODUCT DESIGN AND COUNTERMEASURES

3.1 BAMBOO PRODUCT DESIGN AND DEVELOPMENT

At the beginning, bamboo weaving artworks only had the function of tools, not ornamental, and the artistic value was not high. With Zhang Guozheng's innovation and reform of bamboo weaving techniques, the art of bamboo weaving entered the stage of tire-attachment from tireless molding. The emergence of porcelain bamboo weaving has truly elevated bamboo artwork to a realm of excellence. With China's international integration, the art of bamboo weaving has developed at a rapid pace. In Japan, for example, since the Tang dynasty brought the art of bamboo weaving from China to Japan, bamboo weaving artwork has become popular in Japan and has continued to do so until now. Some European and American countries have also started to popularize bamboo weaving culture in the past few years [19].

It is undeniable that the bamboo weaving craft does face some problems. In many places, bamboo weaving technology only in the hands of a group of old generation of craftsmen, young people are not interested in bamboo weaving, unwilling to learn, the problem of lack of successors in the transmission of technology is more serious; because of the focus on the bamboo weaving process of fresh blood is less, in the product design and research and development is also highlighted weak, product types and style forms mostly stick to tradition, lack of innovation; compared with plastic and other products, as a traditional handicraft Compared with plastic and other products, the production of bamboo products as a traditional handicraft is often a purely manual process, thus the process is complex, time-consuming, high cost, market competitiveness is weak; in addition, the audience is also an important issue is small.

The impact of other related products in the modern market and the urgent need for innovation of their own processes and other problems, resulting in the current internal and external problems of bamboo woven products, bamboo woven products sounded the alarm, must reposition themselves reasonably, and actively reform and innovation.

3.2 BAMBOO PRODUCT DESIGN AND APPLICATION

Bamboo weaving products are developing rapidly. The art of bamboo weaving has been skillfully used in furniture design, ceramic products, architectural design, etc.; in Japan, bamboo woven architecture and household items can be seen everywhere, their bamboo artwork is more rigorous as well as exquisite; Europe and the United States, bamboo culture as a small everyday objects appear very little, mostly for the production of houses, chairs and beds and other relatively large objects, the degree of exquisite and innovative than the Chinese bamboo art to Some countries in Southeast Asia are rich in bamboo, plus their local economic and cultural problems, bamboo artworks are more common in their local areas, such as bamboo buildings, which can be well adapted to the warm and humid environment of Southeast Asia. They also use a lot of bamboo products in their lives, mainly daily necessities, such as bamboo baskets for buying and holding things, bamboo buildings for living, bamboo chairs for resting, etc., which are convenient and environmentally friendly [20].

3.3 INNOVATIVE PROMOTION OF BAMBOO WOVEN PRODUCTS

3.3.1 PRODUCT RE-INVENTION

From the perspective of product design, we study the materials and techniques of traditional bamboo handicraft, and gain an in-depth understanding of the problems and directions of improvement of bamboo handicraft industry and products in the modern environment from the perspective of consumers and practitioners; through the analysis of excellent cases of traditional craft redesign, we summarize the path of integration of tradition and modernity, craft and design, and explore the direction and laws of modern redesign of traditional bamboo handicraft. "Reinvention" is a new design trend, which focuses on different methods and techniques of thought, and has a certain originality and subversion with the cognition and daily use habits of traditional things. There is no rule for the method, mode, procedure and way of "redesign", that is, "there is no fixed method of thinking", and its thinking subject can often jump from one thinking mode to another when designing, which is unexpected in other people's eyes and in It brings humor to people or is amazing. The products designed under this jumping mode of thinking will be very rich.

3.3.2 INITIAL PRODUCT PROMOTION

Today, the globalization of information, bamboo products to firmly grasp the huge information technology promotion thin belt, focus on promoting themselves. At present, the promotion of bamboo products can be summarized as news media promotion, exhibition participation in the promotion, network information promotion and other three forms. Promotion of bamboo woven products mainly include product quality, product features, new products developed, product prices, bamboo woven artists performance and provide good service. Bamboo product management, management, promotion, should work around these aspects.

IV. DESIGN OF BAMBOO WOVEN PRODUCTS

4.1 BAMBOO PRODUCT DESIGN PRINCIPLES

While protecting and spreading the art of bamboo weaving, bamboo product design should realize the practical value of living. Only when the product is integrated into clothing, food, housing and transportation, people can more deeply feel the cultural connotation contained in the product, which is the need of the market and the demand of the product design industry development. Therefore, product design should adhere to the principles of practicality, aesthetics, serialization and living heritage, so as to meet people's life and spiritual needs, in order to give full play to its proper value.

4.2 DESIGN SOLUTIONS FOR BAMBOO WOVEN PRODUCTS

The product itself is the embodiment of culture, and at the same time it is creating a new culture. Designers will dig deeper into the connotation of cultural elements through product design and present Chinese cultural elements to consumers in a tangible form, thus materializing cultural characteristics. Excellent design is a combination of regional cultural characteristics, traditional cultural essence and cultural trends of the times, and the integration of cultural elements based on the injection of new artistic forms and aesthetics, not only to transmit the multi-cultural to consumers, so that consumers gain cultural pride and cultural identity, but also to bring consumers a unique experience. Bamboo product design will be based on Chinese culture, digging typical elements; adhering to the unique characteristics, giving the product connotation; expanding the vision of innovation, injecting the power of science and technology; close to social life, to meet the potential demand.

4.3 SHAPE OF BAMBOO WOVEN PRODUCTS

The shapes of bamboo woven products can be varied, and only a few of them are used below as a display (Fig.3).



(a) bamboo woven stool



(c) bamboo woven lady's



(b) bamboo woven lamp



(d) bamboo woven fruit plate

Fig. 3 Bamboo woven product shapes: (a) bamboo woven stool, (b) bamboo woven lamp, (c) bamboo woven lady's satchel, and (d) bamboo woven fruit plate

V. BAMBOO WOVEN PRODUCT DESIGN EXAMPLES

With the development of society, information technology and industrialization, various industrial products are springing up, but more and more traditional handicrafts are gradually disappearing from our sight, and traditional bamboo weaving is one of them. Bamboo weaving is a long-standing traditional handicraft that has been passed down in China for thousands of years, but is still very much alive. Often the most creative, innovative, simple or eye-catching designs come from the vast majority of people's daily lives in the environment in which they live. Unique ideas, instantaneous designs are closely related to life. This shows that life not only gives the source of artistic design, but also brings more aesthetic expression to people's daily life, thus making their daily life full of art. Nowadays, as people's living and living conditions improve, they want living conditions to be environmentally friendly, so the style of "bamboo woven lamp" will become one of the new visual pop cultures in home decoration and hanging.

5.1 BAMBOO WOVEN PRODUCT DESIGN SOLUTIONS

People are the main object served by design, and in this process, some material basis created by design art also promotes the improvement of human life quality. Obviously, the design of bamboo lamps and lanterns should not only have artistic influence, but also be functional, regional, national and cultural characteristics; not only beautiful, but also easy to use, giving people a sense of practical, elegant, dignified and robust beauty. Thus, we must seek design ideas and inspiration in the natural environment and people's daily life. The leading ideas, functional positioning and cultural connotation and stylistic characteristics of the work established by the designer in the process of conceptualizing the space work, can be based on modern aesthetics and family popular demand, innovative design and production of distinctive both elegant and practical, rich in personalized characteristics of bamboo woven lamps.

5.2 BAMBOO WOVEN PRODUCTS PLANNING

Design elements are equivalent to the basic symbols in design, and different industries have different design elements. The whole design elements can be divided into seven categories: (1) elements from nature: clouds, lightning, oceans, rivers, lakes, rivers, mountains, deserts, trees, flowers, plants, people, animals, etc.; (2) elements from art: all kinds of photos, movies, dances, TV, cartoons, paintings, sculptures, patterns, logos, etc.; (3) elements from abstraction: circles, squares, triangles, points, lines, surfaces, etc. (4) elements from industry: all kinds of plants, buildings, equipment, machinery, means of transport, transportation, etc.; (5) elements from life: all kinds of household goods, electrical appliances, toys, stationery, furniture, etc.; (6) elements from design culture: national culture, regional culture, folk culture, traditional culture, modern culture, etc.; (7) elements from design style: various national styles, ancient style, modern style, European style, Chinese style, American style, classical style, Mediterranean style, rustic style and other genres.

5.3 INNOVATIVE DESIGN OF BAMBOO WOVEN PRODUCTS

Bamboo weaving is a folk craft in the southern provinces. Bamboo weaving is a weaving process in which bamboo artists or weavers use bamboo yarn and bamboo gabions to form warp and weft by picking and pressing each other with star points. Bamboo weaving culture refers to the bamboo weaving artist, with exquisite bamboo weaving process woven bamboo works and reflect the cultural phenomenon, with a unique weaving process and artistic context, called bamboo weaving gonghua. Now it is applied to the lamp design through flexible transformation.

The bamboo woven painting plate holder lamp adopts the mature wild mushroom on the mountain as the creative design element, and is woven and shaped with silver ornaments hanging chain, which reflects the cultural phenomenon, like a mature mushroom, and the silver ornaments hanging chain is like the dew drops hanging on the edge of the mushroom cap, not only with the bamboo woven culture, but also rich in the connotation of ethnic regional culture [Fig. 4 (a)]. The luminaire itself is an artistic landscape pattern. When used, it is more like a night pearl shining brightly, making people enter the bamboo forest world, which is refreshing.

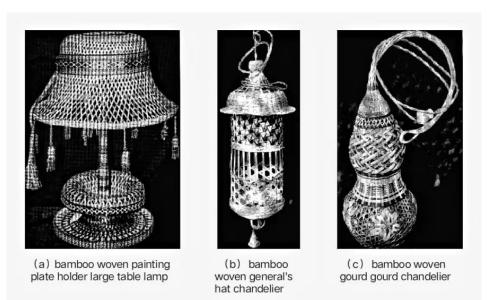


Fig. 4 Innovative bamboo woven products: (a) bamboo woven painting plate holder large table lamp, (b) bamboo woven general's hat chandelier, and (c) bamboo woven gourd chandelier.

Bamboo woven general hat chandelier general hat chandelier using the shape of the general's hat for the design of creative elements, the bamboo weaver fine weaving molding refracted cultural phenomenon, like the upper body of a handsome and sturdy general, symbolizing the pressure of evil into the wealth [Fig. 4 (b)]. Bamboo will be the army cap chandelier pure natural low carbon environmental protection bamboo handicraft production, the performance of bamboo silk flexibility and bamboo weaving delicate handicraft art, is the restaurant, door, living room with ornamental value and use value of high-grade artwork. Weave will army cap with a garden bamboo tube and flower ancient circle installed straight warp gabions. The three twisted wires are expanded from the top downward to weave the cap until the brim is flatward. Weave the bottom of the garden tube hanging brass bells capping set, the military cap set to the top of the lamp tube, the bottom of the capping set bottom.

Bamboo woven gourd melon chandelier to gourd body, hexagonal bullseye woven into the upper body, waist lower body, installation of three-stage silk and lining mouth gabions [Fig. 4 (c)]. The waist section plus a 10 cm wide two-weft silk weave 24 pieces of warp gabions of the waist circumference. For the stem and stem part, 8 pieces of warp gabions are tied together in half, and the ends are folded and knitted in a circular tube of 60 cm length, then opened and knitted into a trumpet. The vine stem trumpet is attached to the upper end of the gourd body. The upper body of the gourd is popped with a yellow herringbone pattern and the lower body with four yellow six-petaled flowers. Other spaces on the lower body are interspersed with red hexagonal and triangular patterns.

The bamboo carp chandelier uses the creative design elements of the carp in biology and the fish belly hiding gold bars (Fig. 5). The bamboo artist carefully weaves the shape, such as the cultural phenomenon reflected by the electricity, like a carp hiding a shining gold bar slowly swimming, not only rich in the meaning of attracting wealth and treasure, but also the cultural symbolism of the year. The weaving process is as follows: weave the lampshade tube, longitudinal diameter gabion three-grain silk, according to the specifications of the waist thin upper and lower flare. To weave the fish shape, use a large piece of hexagonal bull's-eye plane bamboo weave, cut into two pieces of fish shape according to the sample drawing line, intersperse hexagonal plus two triangular patterns, paste the head and tail part of the fish piece decorative patterns and fish eyes. Attach the fish-shaped pieces to the waist of the lampshade with left and right symmetry. Using a thin gabion, join the fish-shaped pieces together by twisting the edges to form a whole. Weave two chandelier straps, press the two-piece flat strips and tie them to the lampshade.



Fig. 5 Bamboo carp chandelier

VI. CONCLUSION

Bamboo is green like jasper, fresh and natural, with a special texture on the surface, comfortable to the touch, with natural beauty, exuding an affinity all over, which is incomparable to other non-natural materials. The bamboo pole is slender and upright, with a combination of flexibility and rigidity, symbolizing life and appearing to be vibrant, and the regular arrangement of bamboo joints makes the bamboo pole show a unique form of beauty. Bamboo material and bamboo culture is an important part of history and culture, an important window for people to understand traditional history and culture, and the key to examine the essence of national culture. In the process of practicing the concept of comprehensive, coordinated and sustainable development, bamboo materials and product design have received attention from all levels. The bamboo weaving process cannot be separated from the times, but should be more receptive to the modern context, try to break through the tradition, bold innovation, strengthen product design innovation, develop bamboo products in line with the aesthetics of modern life, so that the bamboo weaving process out of the niche of self-appreciation, better integrated into thousands of households, only in this way, the bamboo weaving process can continue to be inherited and flourish.

VII. FUNDING

This work was financially supported by funds from the Talent Initiation Project of Zhejiang Agriculture and Forestry University (2022FR007), Bamboo and Wood Industry Innovation Services (H20190219), Functional construction and product design development of wood wool composite materials (HW20220038), Bamboo traditional culture excavation and product design (H20200076), Research on double track design mode based on traditional bamboo cultural products (Y201737972), Innovative services and strategies for bamboo and wood industry based on cultural creativity (HW20220015), Study on the efficiency of binary sign recognition (2020FR021), Exploration of Innovative Entrepreneurship Education Model in Universities in Ethnic Regions under the Perspective of Applied University-Taking Design Major of Baise College as an Example (2018JG38), The Key Research and Development Program of Zhejiang Province (2021C02005), and the Scientific Research and training Program for College students of Zhejiang Agriculture and Forestry University.

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