

AI Empowering Intangible Cultural Heritage: Research on the Integration and Creation Strategy of Jingchu Textile Culture Resources in Art Education in the New Era

Wang Shanshan, Zhang Lei And Liu Xiao

College of Art and Design, Wuhan Textile University, Wuhan, China

Abstract: This article aims to explore the empowering role of artificial intelligence (AI) technology in the inheritance and protection of intangible cultural heritage - Jingchu textile culture, and to study its application strategies in art education in the new era. This article first reviews the historical background, traditional techniques, and their status and challenges in modern society of Jingchu textile culture. Subsequently, the current situation of art education is analyzed, and the existing problems and challenges are pointed out. On this basis, this article proposes the feasibility and necessity of combining AI technology with Jingchu textile culture, and elaborates on the application examples of AI technology in textile design, production, educational dissemination, and cultural inheritance. Furthermore, this article constructs a set of integrated innovation strategies, including establishing an AI enabled Jingchu textile culture database, developing interactive teaching platforms, promoting virtual reality and augmented reality technologies, implementing interdisciplinary teaching models, and establishing an integrated cooperation mechanism between industry, academia, and research. This article provides a new perspective and tool for the inheritance of Jingchu textile culture, and provides theoretical and practical support for the innovative development of art education.

Keywords: Artificial Intelligence; Intangible Cultural Heritage Inheritance; Jingchu Textile Culture; Art Education; Integrated Innovation Strategy

1. Overview of Jingchu Textile Culture

1.1 History and Development of Jingchu

Textile Culture

The textile culture of Jingchu has a long and rich history, dating back to the Spring and Autumn and Warring States periods, and is an important component of ancient Chinese civilization. The Jingchu region, centered around Hubei, became an important textile industry base in ancient times due to its superior geographical environment and suitable climate. In history, textiles in the Jingchu region were renowned for their exquisite craftsmanship and unique style, such as the "brocade" and "embroidery" of the Chu state, which enjoyed a high reputation at that time. After entering modern society, despite facing the impact of industrialization, the textile culture of Jingchu still maintained a certain vitality and became an important object for the protection of intangible cultural heritage. [1-6]

1.2 Traditional Craftsmanship of Jingchu Textile Culture

The traditional techniques of Jingchu textile culture mainly include various forms such as silk weaving, linen weaving, embroidery, and traditional printing and dyeing techniques. It not only represents an important component of ancient Chinese civilization, but also reflects the wisdom and aesthetic views of the ancients. Among them, silk weaving is one of the textile techniques with a long history in the Jingchu area. The silk fabrics in the Jingchu area are famous for their exquisite craftsmanship and rich patterns, reflecting the prosperity of ancient Chu culture and the progressiveness of textile technology. Silk weaving techniques are famous for their exquisite, smooth and exquisite patterns; Hemp weaving is another important textile technique in the Jingchu region, characterized by durability and simplicity, which adapted to the living needs of ancient people. Hemp fabrics have been widely

used in daily life and clothing making throughout history, reflecting the pragmatic and simple spirit of Jingchu culture; Embroidery, with its exquisite needlework and vivid patterns, is loved by people and is a highly expressive form of skill in the Jingchu culture. Embroidery is not only used for clothing, but also showcases its unique charm in various daily necessities and decorations. Traditional printing and dyeing techniques include plant dyeing, blue dyeing, etc. Especially the blue dyeing technology, with its unique cultural significance and dyeing effect, has become one of the important dyes for the development of the textile industry in Hubei Province after the Ming and Qing dynasties. [7-12]

1.3 Current Situation and Challenges of Jingchu Textile Culture

As an important component of China's intangible cultural heritage, the current situation and challenges of Jingchu textile culture are a complex and profound topic. The Jingchu region has a thousand-year-old traditional printing and dyeing culture, and the rich natural dyeing resources have created a colorful Chu clothing culture. Among them, plant dyeing "blue dyeing" has become one of the important dyes for the development of the textile industry in Hubei Province after the Ming and Qing dynasties. However, with the process of industrial development, the glory of the handmade printing and dyeing industry has quietly changed, and traditional printing and dyeing techniques are facing the current situation of rescue, protection, inheritance, and innovation. Currently, the textile culture of Jingchu is facing a series of challenges. On the one hand, with the influence of modern lifestyles, the market demand for traditional textile products is gradually decreasing; On the other hand, there are fewer and fewer inheritors of traditional crafts, and the younger generation has a low interest in traditional handicrafts, leading to a gap in the inheritance of skills. In addition, the lack of effective market-oriented operation and innovative mechanisms makes it difficult for Jingchu textile culture to adapt to the development trend of modern economy. Therefore, exploring how to use modern technological means, especially AI technology, to promote the protection, inheritance, and development of

Jingchu textile culture has become an urgent problem to be solved.

2. The Current Situation and Problems of Art Education

2.1 Analysis of the Current Situation of Art Education

The current art education plays an important role in enhancing national aesthetic literacy and promoting cultural development. With the continuous development of the social economy, art education has gradually received widespread attention. However, China's art education still faces many challenges and problems. In many regions, especially impoverished areas, there is a shortage of art education resources and insufficient teaching staff, resulting in students not being able to enjoy the necessary art education. The imbalance of such resources seriously affects the comprehensive development of students. Some schools and parents still have a superficial understanding of art education, neglecting the important role of art education in cultivating students' comprehensive development and innovative thinking. This outdated educational philosophy seriously restricts the promotion and deepening of art education. Furthermore, China's art education mainly focuses on traditional art, with relatively less tolerance and involvement in modern art and multiculturalism. This limits students' horizons and creativity, making it difficult for them to adapt to the increasingly diverse social environment. Although China's art education has made certain progress, there are still many urgent problems that need to be solved. These issues include uneven distribution of educational resources, outdated educational concepts, single educational content, and weak teaching staff.

2.2 Problems in Art Education

Art education plays an important role in cultivating students' creativity, aesthetic ability, and cultural literacy. Although art education has made some progress, there are still some prominent problems. Firstly, there is a serious disconnect between art education and the development of the times, and teaching content often fails to reflect the latest trends in contemporary art in a timely manner. The curriculum content of art education is often

limited to traditional painting, music, etc., lacking modern art and interdisciplinary content. Secondly, traditional teaching methods overly rely on lectures and demonstrations, lack innovation and interactivity, and cannot stimulate students' interest and creativity in learning, which is not conducive to the cultivation of their creativity. Furthermore, the construction of the teaching staff in art education lags behind, and there is a relative shortage of high-level art teachers, which affects the improvement of teaching quality. To solve these problems, it is necessary for the government, educational institutions, schools, and all sectors of society to work together to increase the importance of art education, increase investment, reform teaching content and methods, strengthen the construction of teaching staff, and establish a more scientific and reasonable evaluation system. Through these measures, the comprehensive development of art education can be promoted, providing support for the diverse growth of students.

2.3 Challenges Faced by Art Education

Art education will face various challenges in its future development. Firstly, how to integrate modern elements while maintaining the essence of traditional art, and make art education more in line with the pulse of the times, is an important issue. Secondly, art education needs to make more use of technological means, such as AI, VR and other new technologies, to improve teaching efficiency and student learning interest. Finally, the internationalization process of art education has also brought many challenges. How to carry out international exchanges and cooperation while maintaining local cultural characteristics is the key to the future development of art education.

3. The Application Status and Development Trend of Ai Technology in Art Education

3.1 Overview of AI Technology

Artificial Intelligence (AI) is a discipline that studies and develops theories, methods, technologies, and application systems for simulating, extending, and expanding human intelligence. As an important component of computer science, artificial intelligence aims to understand the essence of intelligence and

create intelligent machines that can respond in a way similar to human intelligence. Artificial intelligence (AI) refers to the intelligent behavior exhibited by artificial systems, covering multiple subfields such as machine learning, natural language processing, and computer vision. the development of AI technology has brought revolutionary changes to various industries, including the field of art education. By simulating, enhancing, and expanding human creativity, AI technology is gradually changing the way art is created, taught, and appreciated. Artificial intelligence, as a discipline that simulates and expands human intelligence, covers a wide range of research fields and applications. From intelligent manufacturing to medical diagnosis, from autonomous vehicle to intelligent voice assistants, artificial intelligence is profoundly changing people's lives and social development.

3.2 Application Examples of AI Technology in Art Education

The application of AI technology is becoming increasingly widespread in art education. AI can use algorithms to generate unique works of art, providing students and teachers with new ways of creation and expression. This technology not only expands the space for artistic creation, but also challenges traditional definitions of creation and creativity. For example, AI tools such as Stable Difusion and Midjournal greatly enrich the creative path of visual art through efficient image generation techniques. AI technology has effectively filled the gap in students' artistic basic abilities in design and drawing education. For example, the research case of Shanghai Jiao Tong University shows that by combining innovative thinking and personalized learning paths, AI helps first-year architecture students quickly generate design concepts, improve drawing skills, and enhance spatial imagination. In addition, AI can analyze a large number of art works, identify the style characteristics and usage skills of different artists, and build a huge database of art styles and technologies. This provides students with abundant learning resources to help them gain a deeper understanding of art history and theory.

3.3 Development Trends of AI Technology in Art Education

The rapid development of artificial intelligence (AI) technology has provided new possibilities for the inheritance of traditional culture. AI technology can provide technical support for innovation in textile technology through data analysis, pattern recognition, and other means, while opening up new teaching paths in the field of art education. Looking ahead to the future, the application of AI technology in art education will show the following trends: firstly, the deepening of personalized learning, AI will be able to provide tailored learning plans and resources for each student; the second is the enhancement of interactive experience. Through virtual reality (VR) and augmented reality (AR) technology, students can immerse themselves in a simulated art environment for learning and creation; the third is the strengthening of interdisciplinary integration. AI will promote the cross integration of art and other disciplines such as science and engineering, and cultivate versatile talents; the fourth is the improvement of intelligent evaluation systems, where AI will play a greater role in work evaluation and skill assessment, improving the fairness and accuracy of evaluation. Through these development trends, AI technology will continue to drive innovation and development in art education.

4. AI Empowering the Integration and Creation Strategy of Jingchu Textile Culture Resources

4.1 Feasibility Analysis of The Combination of AI Technology and Jingchu Textile Cultural Resources

The combination of AI technology and Jingchu textile cultural resources has significant feasibility. the image recognition and processing capabilities of AI can be used to analyze and reproduce complex textile patterns, and machine learning algorithms can assist designers in understanding the rules of traditional patterns and creating new designs. In addition, the data mining function of AI helps to extract information about Jingchu textiles from historical literature, providing support for research and education. AI can also guide the innovation and marketing strategies of textile products by simulating and predicting market trends.

4.2 Innovation pathways of Jingchu textile cultural resources under AI empowerment

The innovative approaches empowered by AI include: using AI to automate pattern design, allowing traditional patterns to be quickly recreated and personalized customized; Using an AI assisted color matching system to restore the colors of ancient fabrics; And using AI enhanced virtual simulation technology to reproduce ancient textile process flow. These innovative approaches can not only enhance the artistic value and market competitiveness of Jingchu textile culture, but also attract more young people to participate in the learning and inheritance of traditional culture.

4.3 Construction of Integrated Innovation Strategies

In order to effectively apply AI technology to the inheritance and innovation of Jingchu textile culture, it is necessary to construct a set of integrated innovation strategies. This includes establishing an AI enabled database of Jingchu textile culture, collecting and integrating historical data with modern design elements; Develop an interactive teaching platform that utilizes AI to provide personalized learning experiences; Promote the application of VR and AR technologies in textile culture education and exhibition; Implement interdisciplinary teaching mode, combining art and design with engineering technology; And establish an integrated cooperation mechanism between industry, academia, and research to promote technological innovation and the development of the cultural industry. Through the implementation of these strategies, it can effectively promote the protection, research, and education of Jingchu textile cultural resources to develop in depth.

5. Conclusion

Through in-depth analysis and case evaluation of this study, we recognize the enormous potential and value of AI technology in empowering Jingchu textile culture and art education. AI can not only promote the innovation and inheritance of traditional skills, but also bring new teaching methods and learning experiences to art education. Future research should continue to explore the deep integration of AI and the art field, while paying attention to the impact of technological

development on humanistic spirit, ensuring that while promoting technological innovation, it can also protect and promote the diversity and uniqueness of human culture.

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