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Computer-Aided Design AND APPLICATIONS

# Application of VR-based Promotion of Deyang Chao Fan for New Media Perspective

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**Abstract.** Deyang Chao Fan has a long history and rich cultural deposits. Its unique production technology has been regarded as one of the best in Sichuan, and it has an irreplaceable position in Chinese fan culture. With the state's attention to and protection of traditional craft, the education department has paid attention to teaching the tidal fan technique in Deyang. Therefore, the promotion and application of the tidal fan technique teaching in Deyang has become a hot topic in the field of new media. In the new media environment, this paper also uses VR technology to explore teaching innovation, technology promotion, and the application of the Deyang Chao Fan technique. First of all, through literature investigation and tracing, the historical development of Deyang Chao Fan and the development status of VR technology in various countries will be explored. Starting from the teaching problem of the Deyang Chao Fan technique, the teaching process is optimized. Using VR technology and skills teaching courses to integrate and analyze the defects in the construction and application of teaching courses and put forward solutions. Finally, with the help of VR technology, the three-dimensional virtual reality interactive system is constructed, and the high-precision skill teaching scene is built to complete the promotion and application of Deyang Chao Fan skill teaching. The research results show that VR technology, with its own characteristics in the new media perspective, has an obvious promotion role in the teaching and promotion application of tidal fan skills in Deyang, which can optimize the teaching effect and improve the quality of teaching and promotion.

**Keywords:** New Media Vision; VR Technology; Deyang Chao Fan; Teaching Integration; Popularization and Application
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## 1 INTRODUCTION

Deyang Chao Fan originated from Chaozhou, Guangdong Province. In the late Qing Dynasty, Deyang fan artisans improved it and became a unique style in Sichuan arts and crafts while constantly improving the technological level. Deyang Chao Fan is exquisitely made, has beautiful fan paintings,

and is elegant and popular [1]. The fan is made of bamboo, covered with a cardboard shell and painted with small pictures. The bottom is made of silk and is equipped with poetry and painting. Its best products have been presented to presidents of other countries with national gifts, and are now collected in major museums. The technical teaching of Deyang Chaofan has a history of more than 100 years [2]. At the same time, the production of fans is a completely manual process with quite complex technology, which gradually becomes perfect through the continuous improvement of the inheritors. Its exquisite shape and unique production process have high cultural connotations and values [3]. Chinese fans are very strange, not only square but also round, semi-circular, etc. The Deyang Chao Fan is shaped like a gourd based on traditional paper, so it is also called a gourd fan [4]. After many subsequent adjustments, the fan is fixed as symmetrical and uniform left and right, and the shape is a big circle and two cross ovals together constitute the golden section of the fan, so its shape is elegant and never tired of seeing [5].

In addition to the complexity of the production process, the painting subject matter of the Dezhou tidal fan picture is more extensive. From the perspective of the Ming and Qing dynasties, fan painting has gradually become independent and has become a unique category of painting. On the fan surface, it can not only match poetry and painting but also match various themes such as landscapes, flowers, and birds [6]. It has carried the Chinese traditional ink painting and calligraphy art for thousands of years and is also an important representative component of Chinese fan art. Dezhou, tidal fan themes, can be divided into four categories: landscape, most of the ink landscape, and all kinds of works that are elegant and popular. The second is literati painting, which has long been appreciated and sought after by Chinese people for plum, Orchid, bamboo, and chrysanthemum [7]. The third kind is flowers, birds, fish, and insects, which are mainly depicted by meticulous brushwork and lifelike. The fourth is the beautiful woman category, the performance of the ancient four beautiful women and other relatively festive themes.

Exquisite production technology makes teaching the Deyang Chao Fan technique an important part of art education. Its workmanship is also reflected in the steps, fine workmanship, rigorous and reasonable structure. The skill teaching of Chaofan in Deyang can be subdivided into more than 50 steps, which are interlinked [8]. Each step pays attention to the order and fine production; the production process is quite rigorous, and every step of the process must be carefully checked. The required material is polished and clean, and the distance and proportion meet the requirements. In addition, in the new media environment, Deyang Chaofan not only has unique craftsmanship and appreciation value but also becomes an important representative of expressing gratitude to each other as a gift and collection [9]. In the context of new media, the rapid development of science and technology provides new opportunities for the teaching of the complex skills of Deyang Chaofan. The traditional teaching method is simple and rough, and the teaching effect is limited by space. Therefore, how to use emerging technologies to innovate the teaching, promotion and application of the Deyang Chao Fan technique in the perspective of new media has become a hot topic in the current research of arts and crafts. As virtual reality VR technology has emerged in various industries in recent years, this paper also uses it to conduct research in the teaching and promotion application of Chaofan technology in Deyang to explore the innovation path of skill teaching and the change of the effect of promotion and application.

## 2 VR TECHNOLOGY AND DEYANG CHAO FAN TECHNOLOGY DEVELOPMENT STATUS

Nowadays, with the rapid development of technological innovation, virtual reality (VR) technology has achieved good application effects in various fields such as military, medical, and education. Kaimal et al. [10] used computer-based virtual reality technology, with the help of sensing technology, multimedia technology, and graphic simulation technology, which has become the main content of creating 3D virtual environments. Enable the audience to fully experience multi-sensory interactions such as auditory and tactile senses. The application of pseudo-reality technology not only promotes people's creative thinking but also has integration and virtual quantification, bringing the audience a dual integration of perception and rationality. Promote the audience to form a profound understanding of concepts and generate unlimited creativity. Therefore, imagination is also one of

the important features of virtual reality technology. The development of virtual reality technology is also reflected in interactivity, and the United States is relatively advanced in this area. Kim and Lee [11] tend to complete human-computer interaction through the natural conditions of virtual environments, using instructions from computers and other sensing devices to control virtual space objects through relevant actions and language. They also applied it to the military field. It mainly focuses on recovery and principle demonstration and trains soldiers with virtual reality scenes. However, due to issues with visual range, endurance, and time, virtual reality technology cannot meet more complex needs, so there is still room for improvement.

In the new media environment, VR technology provides a highly immersive learning platform for the teaching of Deyang Chao Fan technology. This immersive experience greatly enhances learning engagement and interest, allowing students to gain a deeper understanding of complex technical principles and operational processes. The unique interactivity of VR technology transforms the learning process from one-way knowledge transfer to two-way or even multi-directional interaction. VR teaching from the perspective of new media breaks the limitations of time and space, enabling knowledge of Deyang Chao Fan technology to transcend geographical boundaries and be shared globally. Meanwhile, through the built-in tutorials and instant feedback system, students can evaluate their learning outcomes in real-time and adjust their learning strategies based on feedback, forming personalized learning paths. Students can wear VR devices just like in the actual working environment of tidal turbines and intuitively experience the conversion process of tidal energy, the dynamic operation of wind turbine blades, and the maintenance details of the equipment. Students can simulate and operate various components of tidal turbines in a virtual environment for practical exercises such as troubleshooting and performance optimization. As demonstrated in the field of intelligent manufacturing, VR technology can also stimulate students' innovation and imagination in the teaching of Deyang Chao Fan technology. Lei et al. [12] accessed the same teaching environment through VR platforms, participated in learning and discussions together, and promoted the widespread dissemination and in-depth exchange of knowledge. This creative learning environment lays a solid foundation for students' future research and career development. In the virtual environment, students can freely explore and try different design concepts and solutions and even create new tidal energy utilization technologies.

In the teaching of Deyang Chao Fan technology, although the direct application of 3D scanning may not be the main focus, the interactivity provided by VR technology itself can greatly enhance students' learning experience. Liu and Phongsatha [13] interact with virtual tidal turbines through VR devices, simulate operations, troubleshoot, optimize performance, and deepen their understanding of technical principles and operational skills. In the teaching of Deyang Chao Fan technology, VR technology can simulate the actual working environment of tidal fans. This immersive learning environment greatly enhances students' attention and engagement, allowing them to gain a deeper understanding of the complexity and application prospects of tidal fan technology. Including the ocean environment, tidal changes, and the working principle of tidal fans, students feel like they are in a real scene. This interactive learning method is more intuitive and effective than traditional theoretical lectures and two-dimensional graphical presentations. 3D scanning technology is used in furniture design to quickly obtain three-dimensional data of object surfaces, providing accurate foundations for design. Sansom and See [14] communicate and discuss with experts and scholars from different countries and regions through VR platforms, jointly solve technical problems, and promote innovation and dissemination of knowledge. The rise of new media has made knowledge dissemination no longer limited by geography and time. With the support of VR technology, the teaching of Deyang Chao Fan technology can transcend national borders and time zones, achieving global resource sharing and collaborative learning. At the same time, teachers can also use VR technology to create virtual classrooms for remote teaching and tutoring, improving teaching efficiency and quality.

Deyang Chao Fan belongs to the cultural heritage of traditional craftsmanship, and Shi and Niu [15] analyzed the application of its handicraft skills in folk culture. It integrates into the local people's lives, has local regional characteristics, and has become a symbol of the local area. Deyang Chaofan exhibited different artistic characteristics and forms in different historical periods, reflecting the

changes in people's social life at that time, as well as their wisdom and aesthetic taste. In the 1940s, China sent four Deyang Chao Fan to the United States, painted by Xie Qusheng and Zhang Daqian. After receiving it, the President of the United States spoke highly of Deyang's extraordinary abilities, calling it a treasure of Eastern art, and donated two of them to the National Museum of the United States. Afterward, Deyang Chaofan, as a high-end gift specially made for diplomatic gifts, has been sent to multiple countries. According to historical research, craftsmen in Deyang during the Qing Dynasty used silk and bamboo wrapping, mainly in the shape of an oval, with bamboo tube fan handles. The fan surface was painted with landscapes, birds, insects, beautiful women, flowers, and other elements. This technology is both complex and sophisticated, whether it's everyday items or handicrafts. Therefore, during the development process, the Deyang Chao Fan evolved into various forms such as circular, square, and gourd-shaped. Subsequently, production resumed in 2005, and Deyang Chaofan inherited people's most distinctive gourd shape, thus carrying out mass production. The gourd shape is currently the most representative design of Deyang trendy fans on the market, but in fact, its shapes are also diverse and can be changed according to people's creativity.

## 3 THE APPLICATION RESEARCH

### 3.1 Tidal Fan Skills in Deyang From the Perspective of New Media

Chinese fans have a history of three to four thousand years, so China is also known as the "kingdom of fans" in the world, and the shapes of fans are varied. Bamboo and feathers were the main materials used to make fans in ancient times, and they later evolved into thousands of other materials. It not only has a specific use function but can repel mosquitoes, a cool and auspicious symbol in ancient mythology often used to expel demons as a carrier. However, fans have their own unique aesthetic and ceremonial characteristics in Chinese culture. The craftsman's production of fans is also very sophisticated; fan structures commonly use bamboo, ivory, tortoiseshell, jade, rosewood, and so on. A fan is a large number of silk weaving materials, such as paper, silk, silk, and yarn, supplemented by bird feathers, palm leaves, betel leaves, and so on. Since the Western Han Dynasty, Hehuan fans have been particularly popular. He Huan fan is also called palace fan or group fan; its shape is mainly round. The middle axis of the fan handle is symmetrical, and the fan surface is made of thin silk, which can be matched with poetry and painting. Deyang, located in Sichuan Province, also has its own unique fan culture. Deyang Chao Fan originates from the group fan of Chaozhou, Guangzhou, which is a typical group fan. With bamboo as a frame, the fan is round and pasted with thin silk paper. In the teaching of the modern Deyang Chao Fan technique, the concept of the fan is defined in detail, and the difference between the Deyang Chao Fan and the Chaozhou group fan in Guangzhou is distinguished. We have sorted out the details of the Chaozhou Fan and Deyang Chao Fan as shown in the table below:

| | *Chaozhou Fan* | *Deyang Chao Fan* |
|---|---|---|
| Form and structure | Inner pocket shape | Gourd shaped, square shaped, circular shaped |
| Bamboo thread count | 72 | 168 |
| | 60 | 144 |
| texture of material | Bamboo | Bamboo |
| | Jade | Sheep tibia |
| | bone | Ivory |
| Pattern design | Symbolic | Bat pattern |

| | | |
|---|---|---|
| | Characters, landscapes | other |

**Table 1**: Detailed detail table of Chaozhou fan and Deyang Chaozhou fan.

It can be seen from Table 1 that the Chaozhou fan is shaped like an inner pocket, while the Deyang fan is shaped like a gourd, a square, a circle, and so on. The number of bamboo strands in the handle of the Deyang Chaozhou fan is also more than that of the Chaozhou fan. In terms of material, the Chaozhou fan uses bamboo, bone, and jade, while the Deyang Chaozhou fan uses bamboo, sheep tibia, cow tibia, and ivory. From the difference in the material of the fan, although both use silk material, the Deyang Tide fan mounted rice paper under the silk material to increase the texture. Finally, it is the differentiation of fan skills. Chaozhou fans are mainly based on symbolic patterns, followed by human patterns and landscapes. Deyang Chaozhou fans are mostly painted with bat patterns, flowers, birds, landscapes, ladies, etc., which are obviously different from Chaozhou fans. Due to the complexity of skill teaching in Chaoshan Deyang, VR technology is applied and innovated in the process of skill teaching in the multimedia environment. V R is also the abbreviation of virtual reality technology, is the use of computer system structure to build a 3D photography virtual imaging process, and through this three-dimensional image to simulate the change of stereo image in the virtual environment. VR technology can stimulate people's vision, hearing, and touch so that students have a sense of reality. Its simulation system is also obviously superior to the traditional computer system, which can complete the multi-perception information interaction. The use of VR technology to integrate and innovate the teaching of tidal fan technology in Deyang can reflect the teaching method of immersion, interaction, and sharing. Immersion is also the most important feature of VR technology. In the simulation of reality atmosphere to create Chaoshan skills teaching process. Moreover, through its interactivity, students are allowed to participate in the actual operation and complete the interaction between virtual objects and scenes. Through language, action, touch and other commands, the Deyang tide fan craft production process is simulated. This interaction increases students' learning experience and facilitates students' exploration of craft learning. Before using VR technology to simulate the production process of Deyang Chao Fan technology, we first analyzed the drawing of the Deyang Chao Fan surface and used the data graph to show the distribution proportion of common patterns of the Deyang Chao Fan surface:

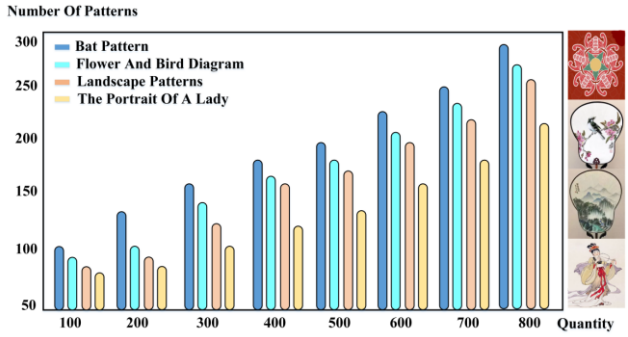


**Figure 1**: The distribution ratio of common patterns on the fan surface of the Deyang Chao Fan.

As can be seen from Figure 1, among the commonly used patterns of tide fans in Deyang, bat patterns occupy a large number, followed by flower and bird patterns, landscape patterns, and ladies' pictures. At the same time, the representative Deyang Chao Fan is displayed below the data chart. The traditional skill teaching mode is easy to be limited by time and space, and the unequal distribution of teaching resources will also affect students' learning effect on technology. From the perspective of new media, VR technology can integrate teaching resources and display the complete technical process of the Deyang Chao Fan in students' virtual scenes, improving students' sensitivity.

We will show the teaching process of Deyang Chao Fan's skills after VR technology application integration as follows:

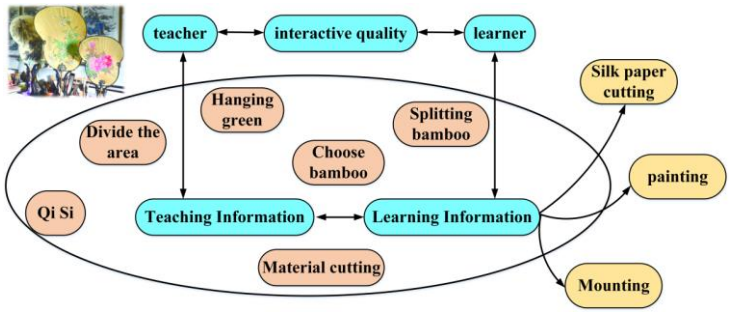


**Figure 2**: The teaching process of Deyang Chao Fan techniques.

As can be seen from Figure 2, in the VR teaching system, there is a strong interaction between teachers and learners, and learning information and teaching information are also in circulation. The process of bamboo selection, cutting, splitting, hanging, slicing and wire drawing in the Deyang Chao Fan technique is virtually displayed in the VR system. At the same time, students can also manually adjust the content of the fan, and complete the steps of cutting, painting, paper hanging, etc.

### 3.2 VR Technology in the Intelligent Promotion

Because of the complex production process and long production cycle, students need to invest in learning for a long time in the art teaching activities. With the gradual evolution of modern craft products, young people are attracted by a variety of entertainment substances and have little interest in traditional culture. At the same time, the technology of Deyang Chao Fans leads to high pricing, which also affects the circulation and sales of fans in the market. The old artists all believe that the Deyang Chaofan, as the bearer of traditional culture, is no longer a practical tool, but more of a craft value product. Giving and collecting are the main functions of fans, and the audience group has also changed. It can be seen that in modern life, the teaching and promotion of Deyang Chao Fan technology is more difficult, which not only requires the wide recognition of various industries but also conforms to the public aesthetic and is close to the masses. This paper uses VR technology to carry out application research on the promotion of Deyang Chao Fan technology, and conveys product information to the masses based on existing consumption, to increase the popularity, influence and sales of fans. Firstly, the exhibition space of Deyang Chao Fan technology is optimized to improve the feeling of the masses. Through the real process of skill teaching, the scene data is updated, and the data source includes the real production method of the tidal fan. VR scenes are used to build real images, and three-dimensional scenes are generated by combining vector data cores. The technical characteristics of the Deyang Chao Fan data collection process are shown in the following formula:

$$S_1 = \sum (a_1 - a_0) \bullet z(x_1, y_1) \tag{1}$$

$$S_2 = \sum_m (a_2 - a_0) \bullet z(x_2, y_2) \tag{2}$$

$$S = S_1 + S_2 + S_3 \tag{3}$$

The formula, $S$ Represents the true feature vector of the Deyang Chao Fan technique. In the virtual scene, it is also necessary to maintain the data information of the scene. The composite data of the characteristics of the real scene can be expressed by the following formula:

$$Z[A_1 + B_2] = (M, X, Y)_0 \tag{4}$$

$$x_1 + y_2 = f(x)k + h_0 \tag{5}$$

In the formula, $Z$ Vector data represents the fan-making process. Referring to the characteristics of various vector data, we can equip it with corresponding practical functions, such as whether increasing the area when designing the sector will affect the actual use effect. Because there are some errors between the 3D image data and the actual generated items, to improve the promotion quality of Deyang Chao Fan technology, we reduce the noise value in the data optimization to reduce the error coefficient. Compare the change of error coefficient of the two groups of feature data before and after VR technology generation:

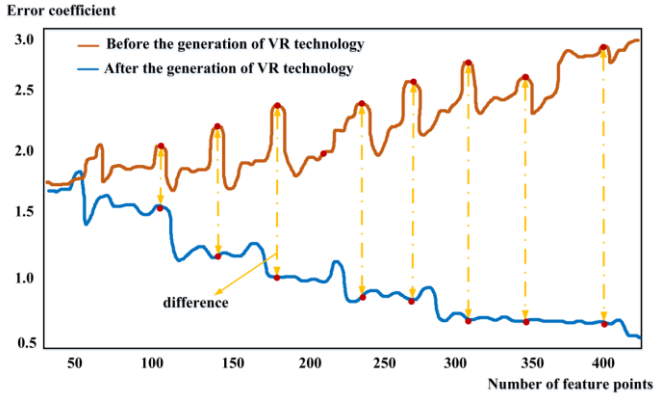


**Figure 3**: The variation of error coefficients between two sets of feature data.

As can be seen from Figure 3, with the increase in the number of technical feature points of the tidal fan in Deyang, the coefficient of error between the works generated by VR technology and the actual work is smaller, while the finished tidal fan generated without VR technology has a larger error coefficient during the design and generation period. At the same time, we also compared the quality coefficient changes of the finished products of Deyang Chao Fan technology before and after noise value optimization reduction. Attached is a detailed diagram of the finished products of the Deyang Chao Fan.

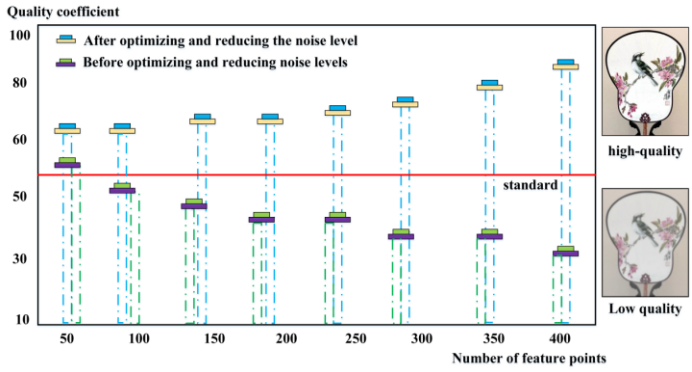


**Figure 4**: Changes in quality coefficient of drying tidal fan craft products before and after optimizing noise value reduction.

As can be seen from Figure 4, after VR is used to reduce the noise value in the promotion of the Deyang Chao Fan, the finished product quality coefficient of the fan remains above the standard range, which also proves that in mass production, the optimized Deyang Chao Fan can ensure its competitiveness in the market. The error control process is shown by the formula:

$$W \bullet x = D_2 \bullet x - D_1 - y \tag{6}$$

$$\sum_{m}^{i,j} k_2 + o \,/\, j_{s+y} \bullet n = u_v \tag{7}$$

$$u_v + v = (m,t)\frac{x \bullet y}{f(x)} \tag{8}$$

There is an offset centre between errors, and this point is taken as a discrete interval, and the data with a large error offset is directly deleted to construct the real scene of point segmentation with the same name. Set an appropriate threshold to provide a dividing line for the constructed 3D space scene:

$$X_n = \frac{X_n^2 - X_n^1}{m-1} * (n-1) + X_n \tag{9}$$

$$Y_n = \frac{Y_n^2 - Y_n^1}{K-1} * (h-1) + Y_n \tag{10}$$

In the formula, $X_n$ $Y_n$ Representing vector data in a standard configuration, each data node coordinate can be represented as:

$$C = L \times \frac{C_0 - C_1}{|| C_0 - C_1 ||} \times J \times C_1 \tag{11}$$

$$H_0 = \int [m+k] \bullet (t-1) \tag{12}$$

The 3D Deyang Chaofan technology promotion scene needs high-precision quality support. In the following steps, VR tools should be selected as the core modeling technology on the basis of ensuring the model level, and VR functions can minimize the complexity of 3D scenes while meeting the fine requirements, so as to save resources. In addition, when VR technology completes the promotion of Deyang Chaofan technology, it also needs to pay attention to the interaction process with users. Use data analysis to collect a large number of user habits and calculate the tendency of the audience:

$$G(P) = Y \mid (x_1, x_2, x_3) + m_0 \tag{13}$$

$$R(t_0) = h_x + h_y + g(x) \,/\, \max \tag{14}$$

In the formula, $R(t_0)$ On behalf of the attention of the masses, the Bayesian formula is used to predict the promotion effect:

$$p(A \mid B) = \frac{P(B \mid A) * P(A)}{P(B)} \tag{15}$$

According to the formula calculation, the calculated result of the promotion effect of VR technology under the new media vision is good. In the future, we need to further judge whether the three-dimensional high-precision scene can be suitable for all the teaching processes of skills.

## 4 ANALYSIS OF THE APPLICATION RESEARCH RESULTS

### 4.1 Results of Tidal Fan Skills

On the basis of the traditional paper fan, the Deyang Chaofan has turned into a new fan form, which is widely loved by the ancient people with its unique shape. Deyang Chao Fan is also called "gourd fan", the homophony of gourd also means fortune, in the use of fans, pour gourd shape has a "blessing" meaning. This pictographic feature not only embodies a variety of cultural concepts but also contains national customs and the masses' pursuit of a better life. From the teaching skills, we know that the production process of the Deyang Chao Fan is more exquisite, the steps are more

complicated and interlocking, and each step pays attention to the order and fine. In addition to the rigorous process in the production, the later inspection also requires the fan to be polished and clean, in line with the standard requirements. From the perspective of new media, we use VR technology to explore the teaching innovation of Deyang Chao Fan technology. Through VR, we can simulate the production process of fans and complete the improvement of student's technical level in virtual space. In order to explore the effect of teaching fusion application, we take the Deyang tide fan thread arrangement task as the condition for testing VR simulation teaching and analyze whether the teaching application before and after using VR innovation fusion is effective:

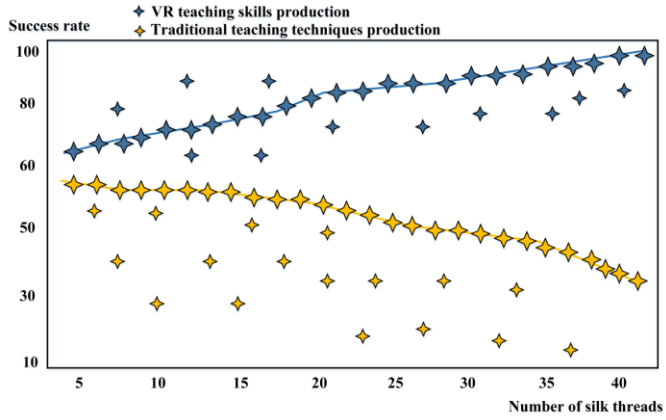


**Figure 5**: Changes in success rate before and after VR technology optimization.

As can be seen from Figure 5, with the increase in the number of tide fan threads in Deyang, the success rate of students who adopt VR teaching innovation to make finished fans remains at a high level. In the face of the increasing complexity of the number of silk threads, the traditional technique teaching method is not conducive to the production of finished products and the maintenance of quality. At the same time, we also found that the teaching skill process created by VR technology can improve the time for students to make fans. According to the changes in the complexity of the internal elements of the fans, the production cycle fluctuation of the fans before and after the optimization of VR teaching skills is compared.

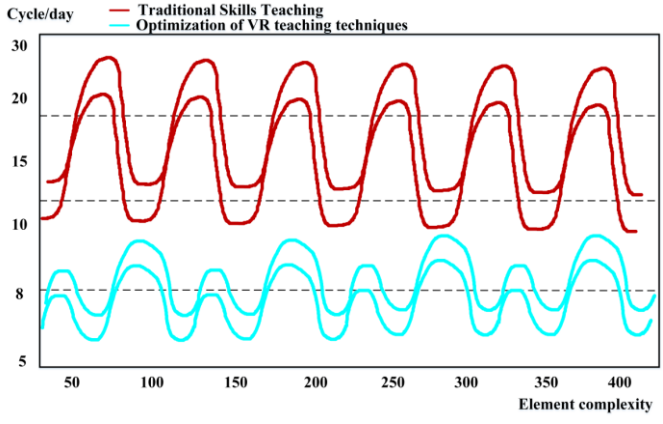


**Figure 6**: Fluctuations in the production cycle of fans before and after optimizing VR teaching techniques.

As can be seen from Figure 6, when the traditional skill teaching method is faced with the requirement of complex elements of the Deyang Chao Fan, the production cycle of most sample objects is relatively long. After adopting VR technology to optimize the technical teaching process, students significantly shorten the production cycle and improve the production efficiency of fans. In the subsequent skill inheritance of the fan, the drawing of the fan is also a top priority, with the use of water and paste to smooth the fan, hanging in the air, natural drying, plus decoration and lace after the completion of the Deyang tide fan crafts.

### 4.2 Results of VR Technology in the Intelligent Promotion

Deyang Chao Fan can not only be used as a practical item for summertime but also as a unique craft to enjoy. Most of the themes painted on the fan surface are created by famous painters themselves, with ink colour, the fan surface is rare and rich, elegant and refined. The technical complexity of Deyang Chao Fan is high, which also leads to obstruction in the actual promotion. We make statistics on the fan themes, material types and their corresponding mass acceptance of Deyang Chao Fan:

| *Fan theme* | *Acceptance rate* | *Fan material* | *Acceptance rate* |
|---|---|---|---|
| Symbolic | 88.9 | Ivory | 79.6 |
| auspicious | 83.7 | Bamboo | 75.4 |
| The portrait of a lady | 80.6 | Sheep bones | 70.3 |
| character | 77.4 | Cow bones | 65.6 |
| Flowers and plants | 70.5 | sandalwood | 54.2 |
| bird | 66.9 | Plastic | 50.6 |
| beast | 63.5 | alloy | 47.8 |
| allusion | 64.2 | Ordinary wood | 30.6 |

**Table 2**: Statistics on the acceptance of Deyang Chao Fan among the masses.

It can be seen from Table 2 that the most popular fan theme is the symbolic and auspicious pattern, followed by ivory material. The production process of the Deyang tide fan is about scraping green, soaking saltwater, splitting into thin silk-like hair round strips, and after sun treatment and silk interlocking, it is woven into a multi-pattern fan frame. Of course, the key link of the whole process is still in the sector, and the silk material is required to be thin and symmetrical, flat and dull. In the research, we use VR technology to promote and update the teaching of tidal fan skills in Deyang and add an online virtual scene experience platform to the innovative promotion plan. Using related equipment and hardware to implement a controlled environment and complete multi-direction intelligent regulation, at this time, access scene experience data can be transmitted to the mass interaction space in real time. In the VR promotion test, the production process on the plane is displayed in the form of holographic interaction, the scene is designed and distributed, and the modulation of the light and shadow effect of the scene is completed. Describe the process logic and use three-dimensional space to show the light and shadow changes of VR promotion as follows.

As can be seen from Figure 7, the logical process also includes the later modelling and visual rendering, which are imported into the VR immersive roaming space to achieve control and query. The changes of light and shadow in the three-dimensional space of Deyang Chao Fan crafts also present the shape of a gourd, and fans from different angles will bring people a more exquisite visual experience. In addition, in view of the shortcomings in the promotion of VR technology, we have adjusted the photon motion delay. That is, when the masses wear VR devices, they can reduce the numbness and delay and then ease the vertigo effect of VR devices by setting the resolution in detail to improve the comfort of the audience.

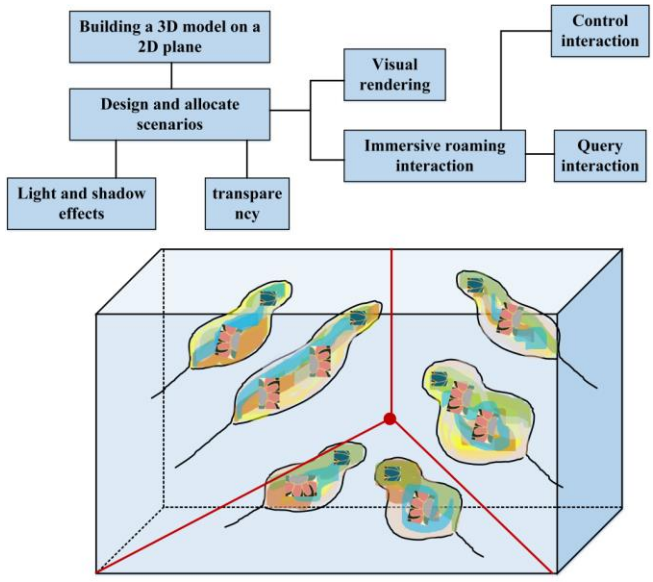


**Figure 7**: The Light and Shadow Changes in VR Promotion.

## 5 CONCLUSIONS

Deyang Chao Fan has a history of more than 100 years, forming its own unique production process and fan culture, which is not only suitable for watching and appreciating from afar but also suitable for playing and tasting with your own hands. The technique of Deyang Chaofan is very complex, its production process is full of exquisite and aesthetic, and the bamboo thread is fine and symmetrical, which is amazing. With the popularity of modern life, more and more young people have begun to pay attention to the inheritance and protection of traditional culture, and the teaching and promotion of the art of Deyang Chao Fan have always been the focus of artists. From the perspective of VR technology and new media, this paper explores the teaching innovation and promotion application of the Deyang Chao Fan technique. Firstly, the technical characteristics of the Deyang Chao Fan are analyzed in detail. The production process is divided into several production steps, and the characteristics of the Deyang Chao Fan are obtained by using data analysis and extraction and added to the VR skill teaching model. The immersive and interactive function of the VR system allows students to complete the experience of making fans in the virtual space, improving the efficiency and quality of making fans. Finally, in the new media perspective, a VR three-dimensional virtual scene is used to build a promotion space of Deyang Chao Fan technology so that the public can experience the light and shadow effect of the fan in the virtual space and observe the exquisite and complex technology of the fan in detail. The research results show that the innovative application of VR technology in the teaching of tidal fan technique in Deyang can improve students' level of fan-making and also has a good reflection on the promotion effect of fans.

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