

# The Use Of Virtual Reality Technology In The Teaching Of Fashion Design

Wang Jing and Yasmin Binti Hussain

**Abstract** – With the rapid development of modern science and technology, computer technology has been widely used in various industrial fields of society, and the education industry is no exception. The application of virtual reality technology in clothing design has greatly improved the efficiency of designers in the redesign process and perfected the wearing effect of clothing. In the field of teaching, the application of virtual reality technology in the process of clothing teaching can stimulate students' creativity, improve the teaching effect and enhance students' interest in learning. The application of virtual reality technology is a new and efficient teaching method that has emerged in recent years with the development of computers, creating a simulation effect for teachers and students that is incomparable to the traditional clothing design teaching process, combining technology and art, with a broad development prospect. Based on practice, this paper introduces the technical model of virtual reality technology in the field of apparel design through apparel design project teaching, analyzes the performance characteristics of virtual reality technology, followed by analyzing the important role and advantages of virtual reality technology in apparel design teaching, and finally analyzes several aspects of the application of virtual reality technology in apparel design, hoping to have certain reference significance and value for updating the teaching of apparel design in means and methods. Finally, we analyze several aspects of the application of virtual reality technology in apparel design, hoping to have some reference significance and value for the updating of apparel design teaching in terms of means and methods.

**Keywords** – Virtual reality technology; Apparel design; Project teaching; Application

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## I. INTRODUCTION

In recent years, the apparel industry has become highly competitive, and higher education institutions that deliver talents to apparel enterprises are also facing difficulties and bottlenecks in professional talent training and curriculum teaching. Due to the progress and changes in apparel design and production processes, some students trained in the previous professional education mode often have difficulty in adapting to the new industry requirements in a short period of time. Based on this, apparel majors actively seek ways to connect teaching and market, combine new digital technologies, and explore strategies and ways to transform applied technology-based disciplines. The current professional course teaching has a single teaching mode, insufficient or backward practical training sites, high requirements for the size of the site and equipment of the apparel training base, large investment, and the practical training base under the school-enterprise cooperation mode is affected by the strength of the cooperative enterprises themselves, there is the problem of unstable project cooperation and difficult transformation of results (Wang Bin, 2022). Coupled with the rapid technological update of apparel professional equipment, the enterprises that can invest in equipment in schools are relatively limited

With the rapid development of computer technology, apparel virtual design technology has become more and more practical, and the scope of application in the apparel field is becoming more and more extensive. Clothing virtual design system can not only save design and boarding time, but also can virtually display the clothing on the human body wearing effect both to save time and save costs, while being able to achieve virtual fitting, virtual dynamic display, etc (Li Geng , Li Guosheng, 2021) .

## II. PROBLEM STATEMENT

### 1. Traditional teaching mode is single

In recent years, clothing professional teaching has been trying to reform the teaching content, teaching methods and teaching conditions, but by the school practical training conditions, financial investment, school-enterprise cooperation and many other reasons, it is difficult to really carry out some project practice teaching. In the teaching process, the teaching methods are traditionally cured, the practical projects are insufficient, and the assessment of teaching effect is single (王彬 (Wang Bing), 2022). And because the traditional teaching of garment profession needs a long process from design to plate making to garment making, students then under this lack of innovative teaching mode, some students gradually lose their interest in learning and lack of independent innovation awareness and ability.

### 2. Traditional teaching and training equipment is backward

As an application-oriented discipline, apparel majors need certain practical training sites and machines and equipment (王彬 (Wang Bing), 2022). With the continuous development of science and technology and machinery and equipment, school-built training rooms are not able to update and iterate in time in terms of equipment and training base construction, and there are relatively few enterprises that can invest in equipment in schools.

### 3. It is difficult to transform the results of school-enterprise cooperation projects

School-enterprise cooperation is influenced by many aspects such as school popularity, professional construction scale, students' skill ability, enterprises' own strength and the actual situation of industry development, etc. Not all schools with garment majors can get good school-enterprise cooperation projects, and the existing school-enterprise cooperation projects are unstable and difficult to be transformed.

### 4. Impact of the epidemic

Because of the global ravages of the new crown epidemic, the development of the apparel industry has been affected, and more and more apparel brands have been hit hard by the offline entity economy. The reduction of consumer purchasing power directly affects the research and

development to production of apparel products. First of all, the process from R&D to production of clothing has become longer, and clothing companies do not have enough money to buy fabrics or constantly make samples, and more and more clothing brand companies have chosen virtual technology for the display of clothing products.

## III. LITERATURE REVIEW

In recent years, Virtual reality (VR) technology has shown its great development potential in many industries. Combining Virtual reality (VR) technology with the game industry brings users a new game experience, as long as they put on the helmet, they can be in the game environment, without leaving home, they can be in another space, which greatly reduces the danger of outdoor games; combining Virtual reality (VR) technology with engineering design, designers can show the design products in 3D interactive form in front of customers, allowing customers to more directly understand the product. Combining Virtual reality (VR) technology with medicine, medical students' learning of medical knowledge no longer stays in books or simple models, but can observe various organs or tissues up close through equipment, which not only improves teachers' teaching efficiency, but also increases students' opportunities for clinical experiments and for repeated experiments on the same case to a proficient level ..... Thus, it can be seen that Virtual reality (VR) technology has a wide range of applications and brings great benefits to all walks of life, which is reflected in the training of university talents, VR courses can be offered in science and technology, art, education and other majors, thus promoting the training of VR talents in various fields and promoting VR in The promotion and development of different industries.

Fashion design courses mainly rely on a series of skills. Virtual reality (VR) is an emerging technology that utilizes mobile and context-aware devices (e.g. smartphones, tablets) that enable participants to interact with digital information embedded within the physical environment (Dunleavy, 2014). It is a new technology that has emerged with potential for application in education (Saidin, Halim, & Yahaya, 2015) and enables users to enrich the real world with virtual content (Tesolin & Tsinakos, 2018). It also augments students' experiences in

real-world environments by dynamically overlapping digital materials with a real-world environment (Elfeky, 2018; Wu, Hwang, Yang, & Chen, 2018) where virtual information corresponds to locations of real-world objects in or proximate to the current location (Sandberg, 2018). Numerous researchers have pointed out that Virtual reality (VR) has immense potential in the enhancement of learning and teaching (Bacca, Baldiris, Fabregat, & Graf, 2014; Bower, Howe, McCre-die, Robinson, & Grover, 2014; Cai, Chiang, Sun, Lin, & Lee, 2017; Foster & Cunniff, 2016). It supports the smooth interaction between real and virtual environments and, in the same time, allows a tangible interface metaphor to be used for object manipulation (Singhal, Bagga, Goyal, & Saxena, 2012). Therefore, it is gaining popularity within society and becoming more ubiquitous in nature (Bower et al., 2014). Recently, it has matured enough and so its applications can be found in both mobile and non-mobile devices (Bacca et al., 2014). Nevertheless, few studies have been in the education field (Saidin et al., 2015). However, researchers and experts who promote the use of the Virtual reality (VR) technology claim that it provides learners with more opportunities to be more skillful and knowledgeable ated to function, aesthetics and creativity. The design of skills and functions is very important. Because fashion designers design for others rather than for themselves, they should consider other people's needs, aesthetics, lifestyle, attitude, desire and so on, so as to design something more suitable for them. And aesthetic skills are very necessary to make fashion products more attractive and popular, and to better express attitudes and ideas. In addition, creative skills usually involve fluency, flexibility, originality and other elements, so fashion design is regarded as an innovative process, designers use inspiration to produce the best creative and artistic experience. Virtual reality (VR) technology can help fashion design students improve their skills in the field of aesthetics and creativity.

#### IV. METHOD

This study focuses on a mixed research approach with experimental research methods, supplemented by quantitative research methods. The sample was selected from 20 second-year students (5 male and 15 female students) majoring in apparel in a higher education

institution in Guangdong Province, China. The project experiment was conducted by selecting different teaching methods of traditional teaching and virtual reality technology teaching in the design of the apparel design project, by comparing the difference of the project results after the students' learning and the time to achieve the project. The comparison is made in terms of creative thinking concept of clothing, overall shape of clothing style, use of creative elements, outer silhouette design, style design, color design, fabric design, software application ability, etc.

The quantitative study was conducted through questionnaires for students and semi-structured interviews with apparel teachers and corporate interviews with a company dedicated to virtual reality technology for apparel professionals.



Figure 1. There 2D design view



Figure2. There virtual dynamic design view

#### V. FINDINGS

When VR technology is applied in clothing teaching, the final effect will show the design drawing of traditional teaching, and can see all angles of clothing in 360 ° three-dimensional. In the design process, it can directly generate clothing structure drawing (paper pattern), modify and adjust the visual effect, and can virtual sew clothing, It can

intuitively see the different effects brought by different properties of different fabrics, and finally form a virtual dynamic clothing show to simulate the wearing effect of real people.

The traditional 2D fashion design teaching is to complete the fashion theme design through the training of creative thinking of clothing, the training of fashion color design, the training of fashion style modeling design and the learning and application of clothing fabric texture, and the use of graphic design software or hand drawing. Finally, a graphic design drawing is displayed, which includes design thinking, color, modeling Fabric characteristics.

## VI. DISCUSSION

The digitalization and intelligent technology of garment industry as well as 3D virtual display technology are gradually becoming a trend of the times. This topic takes the virtual simulation practice teaching platform in apparel design as the research object, dissects the virtual simulation practice teaching projects such as 3D human form, apparel design simulation design, character virtual modeling design, apparel industrialization virtual plate making, 3D virtual fitting experiment, apparel display and sales simulation, in order to highlight the importance of virtual simulation technology to students' innovative thinking training, realize the maximum use of teaching resources The goal is to cultivate digital garment talents and promote the teaching reform of the school in the era of intelligent manufacturing.

The cost of teaching expenses investment is reduced. In the practical training practice, the application of virtual reality technology can simulate the creation of realistic working environment, intuitive operation process, historical costume pavilion, display showroom, as well as 3D simulation fabric selection, 3D sample garment trial production, etc. Compared with the previous teaching faculty, equipment and venue requirements of the apparel design profession, such an approach can effectively reduce the financial investment in teaching and improve the efficiency and skill level of students' practical training.

Teaching form innovation. The use of virtual reality technology in the teaching of apparel is a new form of teaching that adapts to the development of information technology and the goal of training applied talents. Virtual reality technology is immersive, interactive and experiential,

which can make teaching methods more vivid and intuitive, teaching contents more innovative and assessment methods more mobile and flexible. By using virtual reality technology, teachers can help students understand the abstract theoretical knowledge of clothing, establish the thinking basis of three-dimensional space composition of clothing, and let students experience the spatial relationship between human body and clothing modeling more intuitively; introduce the latest industry information technology to meet the needs of professional digital transformation, which is more conducive to cultivating students' learning interests and abilities.

Innovation in the form of school-enterprise cooperation. Based on the latest cutting-edge technology at home and abroad, reform the curriculum system. Strengthen the garment professional application skills and popularize the frontier technology hotspots, and actively follow the process of updating education concepts, keeping up with industry dynamics, strengthening school-enterprise cooperation, and improving teaching quality in a cyclic iterative process, continuously improving the problems that arise in each link, and completing the reform and optimization of intelligent, informative and modernized garment courses. Establish a long-term cooperation mechanism based on the combination of school education and enterprise interests. Teachers participate in the upgrading and transformation of enterprises' informatization, intelligence and lean production, and optimize 3D virtual simulation systems such as VR/AR, participate in enterprises' improvement of production efficiency and refinement, make new designs for enterprises' garment displays, and promote the transformation and upgrading of enterprises. Make the training objectives and industrial needs unified, and strengthen the spirit of craftsmanship of excellence.

Teaching content innovation. In the teaching of virtual reality design, the actual work design and production cases are carried through the whole teaching content, according to the employment group of enterprise positions, driven by the real project tasks of enterprises, oriented by the actual system of students' creation and design, with the market transformation of teaching achievements as the goal, completing the teaching tasks while completing the project tasks, cultivating students' professional habits in the teaching process, realizing the effective connection

between higher vocational education and enterprise job talent demand. In the process of learning, we aim at aligning with the professional job specifications and work standards of enterprises, improving students' comprehensive professional quality and enhancing their employment competitiveness.

**Teaching practice innovation.** Through virtual reality technology design teaching innovation and practice, promote the development of garment industry intelligence, informationization and higher vocational education, provide leadership and talent guarantee for the innovation-driven development of the garment industry, and provide a demonstration role for the curriculum reform of garment vocational education.

**Teaching system innovation.** The reformed apparel practical training course is adjusted to the market and enterprise talent demand, and the content of the apparel practical training course is readjusted to increase the course arrangement of digital intelligent manufacturing practical training and emphasize the cognitive ability training of intelligent manufacturing equipment. As students are familiar with enterprise informationization, intelligence and other high technology, they can quickly integrate into enterprises after graduation, which not only promotes the development of garment professional construction, but also enhances the overall development of enterprise garment technology and the quality improvement of industrial personnel.

## VII. CONCLUSION (OR LIMITATION OR SUGGESTION FOR FURTHER STUDIES)

Virtual reality technology has brought about a radical change in the teaching of apparel design, enabling teachers and students to complete their teaching tasks and plans in a lively and harmonious environment. Professional teachers are no longer bound to use a single form of hand-drawn expression to teach, and a series of complete processes such as design, pattern making, sample completion and sample adjustment are simulated realistically and quickly with the help of computers, greatly improving learning efficiency and teaching effectiveness. The virtual reality technology in apparel design teaching. Virtual reality technology is widely used in the teaching of clothing design, so that the traditional teaching of clothing design from the limitations of the means

of expression, to achieve the transition of three-dimensional models to real products. Teachers cannot through the real production of real objects will be designed to show students the clothing program, but directly use virtual reality technology to design the results of the realistic presentation, in the future will have a broad development prospects.

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