Research on the Reconstruction of AI-enabled Clothing Design Course and the Improvement of Practical Teaching Efficiency

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Abstract

With the iterative upgrading of AIGC technology, digital intelligent technology has fully penetrated the whole chain of clothing industry design, R & D and production, completely subverting the creative logic and industry ecology of traditional clothing design, and forcing the teaching system of clothing design in colleges and universities to carry out all-round innovation. In view of the practical problems such as the disconnection between the existing curriculum system of clothing design specialty and the industrial demand, the low efficiency of practical teaching, and the superficial application of AI technology, the research on the reconstruction of AI-enabled clothing design course and the improvement of practical teaching quality is carried out. Combined with the development trend of regional clothing industry, this paper analyzes the core value of AI technology integrated into the teaching of clothing design specialty, constructs a modular curriculum system that meets the needs of regional industry, builds a teaching mode of ' AI tool + practical training + industry project ', explores the path and guarantee mechanism of improving the efficiency of practical teaching, aiming at cultivating practical clothing design talents suitable for the development of regional clothing industry, and providing practical reference for the digital teaching reform of clothing design specialty in similar colleges and universities.

Keywords

AI clothing design course reconstructs practical teaching, teaching effectiveness, Regional clothing industry.

1. Introduction

At present, artificial intelligence (AI) technology has become the core driving force for the digital and intelligent transformation of the garment industry. With the acceleration of the upgrading of the regional clothing industry, the market 's demand for compound skilled talents with solid clothing design skills, proficiency in AI practical skills, and meeting the needs of local clothing development continues to rise. At present, there are still many shortcomings in the teaching of clothing design majors in local clothing colleges and universities : the update of the curriculum system of clothing majors lags behind the iterative rhythm of AI technology, and the AI-related teaching content is fragmented and unsystematic ; the practical teaching of clothing is separated from the real project of regional clothing, and the practicality and pertinence are insufficient. AI tools are only used as an auxiliary means of clothing professional teaching, and fail to be deeply integrated into the whole teaching process. In this context, the clothing design specialty relies on AI technology to reconstruct the curriculum system, optimize the practical teaching mode and improve the teaching quality. It is not only the inevitable requirement of the digital reform of higher education, but also the key measure for colleges and universities to fit the local service orientation, deepen the integration of production and education, and cultivate high-quality skilled talents[1].

2. The Core Value and Realistic Basis of AI-enabled Clothing Design Teaching

2.1. Fit Regional Clothing Industry Digital Talent Demand

The digital transformation of clothing industry has become the mainstream trend of industry development. The core business of clothing design and style development, 3D virtual sample clothing and digital plate making, production supply chain (production scheduling, quality inspection), user size and personalized customization, e-commerce retail and visual marketing, brand design research and development teaching are inseparable from the support of AI technology. The talent recruitment standards of local clothing enterprises, brand institutions and new media platforms continue to be upgraded. Practitioners are required to not only have solid clothing design skills, but also master the core practical skills such as AI drawing, intelligent modeling, digital image processing and intelligent typesetting. At the same time, they are familiar with the characteristics of regional clothing and have the practical ability of clothing projects. AI empowers the teaching of clothing design majors, which can accurately meet the core needs of industrial posts, break the barriers between campus teaching and market industries, cultivate compound talents who not only understand clothing design and are proficient in AI technology, but also fit the development of local clothing, and inject fresh talent vitality into the development of regional clothing industry.

2.2. To Solve the Practical Pain Points of Low Efficiency of Practical Teaching

There are three bottlenecks in the practical teaching of traditional clothing design for a long time. First, the teaching content is lagging behind, only focusing on the teaching of conventional design software such as Photoshop, lacking the practical content of cutting-edge AI design tools such as Midjourney and Stable Diffusion, and the students ' skills are out of line with the job requirements. Second, the training scene is single, and the practical training is mostly virtual subject exercises, lacking the support of regional clothing real projects, and the cultivation of students ' practical ability is weak. Third, the teaching efficiency is low, hand-painted, basic design and other links take too long, personalized teaching guidance is difficult to land, students ' practical ability to improve slowly.

2.3. Help Professional Digital Reform and Connotation Quality Improvement

Digitalization of higher education is the core direction of current higher education reform. Promoting the deep integration of digital technologies such as AI and big data with professional teaching is the key to improving the quality and core competitiveness of fashion design majors. AI empowerment curriculum reconstruction and practical teaching can promote the transformation of fashion design specialty from traditional skill-based teaching to digital practical teaching, optimize the allocation of teaching resources, innovate teaching mode, improve teaching evaluation system, and continuously strengthen the construction of professional connotation.

3. Local Clothing Colleges and Universities Clothing Design Professional Teaching Present Situation

3.1. Overview of Professional Education

Local clothing colleges and universities set up clothing design majors such as clothing design, clothing design and engineering, clothing and clothing design, focusing on core areas such as clothing cultural creativity, plastic arts, fashion product innovation, clothing structure and layout engineering, clothing products and supply chains, and are committed to cultivating high-quality skilled talents for textile and clothing, cultural and creative tourism, and digital

fashion industries. These colleges and universities are equipped with basic design training rooms, software operation training rooms and other teaching venues. The faculty team has both front-line teaching experience and industry practical experience, and has established a preliminary cooperative relationship with local clothing enterprises and clothing companies, laying a foundation for the development of clothing professional teaching. However, with the comprehensive popularization of AI technology and the upgrading of regional clothing industry, the existing teaching mode and talent training system have been difficult to adapt to the development needs of the industry, and various teaching problems have gradually become prominent.

3.2. Existing Core Issues

3.2.1. Solidification of Curriculum System

The existing curriculum system is solidified, and AI-related courses only exist in the form of elective courses and short-term practical training courses. There is no systematic and modular curriculum structure, which is difficult to support the systematic cultivation of students ' AI design ability. Clothing design major lacks core courses such as AI intelligent clothing design and clothing digital visual design. Clothing design and engineering specialty does not cover key contents such as intelligent layout design and AI image modeling, and the combination of curriculum content and regional clothing industry is insufficient.

3.2.2. Insufficient Integration of Industry and Education

The cooperation between clothing design majors and local clothing enterprises mostly stays at the level of internship and employment docking, short-term visits, etc., and has not formed a deep integration mechanism of " school-enterprise collaborative education. " Enterprises have failed to participate in the core links of curriculum setting, teaching implementation, practical training and assessment, and AI-enabled teaching reform lacks industry first-line guidance ; colleges and universities do not dig deep into regional characteristic clothing resources, do not integrate local clothing characteristic elements into daily teaching, and the ability of professional services to local clothing development needs to be improved.

3.2.3. Single Teaching Evaluation

The existing teaching evaluation of clothing specialty takes the final homework, theoretical examination and classroom performance as the core assessment content, emphasizes the evaluation of design results, neglects the process practical assessment, and ignores the comprehensive consideration of students ' AI tool application ability, practical design ability and clothing project practical ability. The evaluation subject is single, lacking the external participation of enterprise tutors and industry experts ; the evaluation standard is separated from the actual needs of clothing posts, which can not accurately measure the effectiveness of practical teaching, and it is difficult to provide effective data support for teaching optimization reform.

4. The Practice of AI-enabled Clothing Design Professional Curriculum Reconstruction

4.1. Reconstruction Principle

The curriculum reconstruction strictly follows the core principles of " based on local, docking industry, AI empowerment and practical operation, " closely follows the core needs of regional clothing industry posts, takes the cultivation of professional ability as the fundamental orientation, deeply integrates AI technology into the whole chain of clothing professional curriculum teaching, breaks the traditional curriculum barriers, constructs a modular, practical and digital characteristic curriculum system, and realizes the precise

docking of curriculum setting and clothing post demand, the synchronous update of teaching content and AI technology iteration, and the deep integration of practical training and clothing project.

4.2. Modular Curriculum System Construction

Based on the professional directions of clothing design, clothing design and engineering, clothing and clothing design, and relying on AI technology, the curriculum system of ' basic literacy module + AI core skill module + clothing practice module + expansion and improvement module ' is built. Each module is interconnected and progressive, which fully meets the post ability requirements of the regional clothing industry.

4.2.1. Basic Literacy Module

This module focuses on the cultivation of students ' clothing design core literacy, retains the classic basic courses and optimizes the teaching content, and organically integrates the regional clothing culture elements. The core courses of this module cover design sketch, color composition, plane composition, clothing development history, clothing culture introduction and so on. In the teaching process, students are guided to explore the design elements of local clothing characteristics, abandon the boring teaching mode of pure theory and pure foundation, consolidate the students ' clothing design skills, and enable students to form a design thinking that meets the needs of local clothing.

4.2.2. AI Core Skills Module

This module is the core of the curriculum system, and special AI design courses are set up for different professional directions. Clothing design and other majors set up core courses such as AI intelligent drawing, clothing visual intelligent typesetting, AI modeling, and new media clothing design. Clothing design and plate making majors set up AIAI human body data acquisition and plate type basic modeling, automatic pattern generation and parametric plate making, plate type intelligent correction, defect identification and optimization, AI coding (push plate) and size system optimization, AI + 3D virtual fitting linkage plate making and other characteristic courses, supporting AI tools special practical training, to cultivate students ' core ability of digital design.

4.2.3. Clothing Practice Module

This module closely follows the actual development of the regional clothing industry, focuses on real clothing projects, and realizes the integrated teaching of ' learning, practicing and applying ', which is the core carrier to improve the efficiency of practical teaching. The core courses cover clothing product design, clothing structure plate making, clothing sample making, clothing promotion planning and so on. In the teaching process, the real projects of local clothing enterprises and clothing brands are introduced, so that students can carry out practical training with the project as the carrier, and deeply integrate the cultivation of AI design skills with clothing practice.

4.2.4. Expand the Lifting Module

This module takes into account the personalized development of students and the characteristics of Chinese-foreign cooperation in running schools, and offers extended courses such as new media operation of clothing, cross-cultural two-way enabling design, cross-innovative design, and AI clothing design creative advancement[2]. In view of the Chinese-foreign cooperative clothing design major, the overseas high-quality clothing design concept and AI design skills are integrated, and the teaching is carried out in combination with the local clothing characteristics, so as to cultivate compound talents with cross-cultural design ability.

4.3. Curriculum Implementation Guarantee

Optimize the allocation of course hours, increase the proportion of practical courses and AI skills courses, and the proportion of the two types of courses is not less than 60 %, so that students have sufficient practical training time ; build a special training platform for AI design and a practical teaching resource library for clothing design, including high-quality resources such as industry frontier cases, AI practical tutorials, and clothing design specifications ; promote school-enterprise co-construction courses, invite clothing enterprise experts and senior designers to participate in the development of clothing professional courses and classroom teaching, and ensure that the course content meets the needs of industry frontier and local clothing development.

5. AI Empowers the Path of Improving the Efficiency of Practical Teaching in Fashion Design Majors

5.1. Innovate the Practical Teaching Mode of ' AI + Project + Clothing '

Abandon the traditional " indoctrination " teaching mode, and build a practical teaching mode of " AI tool empowerment + real project drive + clothing scene practice. " Before class, teachers rely on the intelligent teaching platform to publish regional clothing design project tasks, push AI practical tutorials, clothing materials and other preview resources, so that students can be familiar with task content and core skills in advance. In the class, the students take the group as the unit and complete the project design with the help of AI design tools. The teachers use the intelligent teaching system to monitor the students ' actual operation progress in real time and carry out personalized and accurate guidance. At the same time, the enterprise tutors are invited to teach online and offline simultaneously to explain the practical skills of clothing design. After class, students rely on AI tools to optimize the design results, submit project works, and be scored by the school-enterprise double tutors to improve the practical teaching efficiency and students ' practical ability.

5.2. Build School-enterprise Collaborative Practice Training Platform

Co-build AI clothing design training center and off-campus practice teaching base with local clothing enterprises, cultural and creative companies and new media institutions, and create a dual-platform training system of " on-campus special training + enterprise post practice. " In the school, a special training room for AI design is set up, equipped with cutting-edge AI design equipment and software, to simulate the real working scene of clothing enterprises and carry out special practical training. Off-campus, organize students to enter cooperative enterprises, participate in real projects such as clothing product development, clothing plate making, clothing product promotion planning, and temper practical skills in job practice[3].

5.3. Construction of Digital Practical Teaching Resources System

By integrating AI teaching resources and regional clothing characteristic resources, a digital practical teaching resource library is constructed, covering AI design high-quality micro-courses, clothing practice case base, practical video tutorials, virtual simulation training projects and other high-quality content. The virtual simulation training system of regional clothing design is developed to simulate the practical scenes such as clothing product design and development, clothing structure plate making and so on, so that students can reduce the practical cost and improve the training efficiency through virtual simulation training. Produce local clothing AI design boutique micro-courses, focus on regional characteristic clothing elements, disassemble practical difficulties, meet students ' fragmented and repeated learning needs, and make up for the lack of offline practical teaching.

5.4. Build a Diversified Whole Process Teaching Evaluation System

Breaking the single evaluation model of teachers in the school, a diversified whole process evaluation system of ' process evaluation 40 % + result evaluation 30 % + enterprise evaluation 20 % + skill evaluation 10 % ' is constructed, which comprehensively covers the core dimensions of students ' classroom practical performance, AI tool application proficiency, clothing design work quality, enterprise practice performance, and professional skill level.

6. The Effectiveness and Reflection of AI-enabled Clothing Design Professional Teaching Reform

With the empowerment of AI, the teaching quality of clothing design courses has been significantly improved. First, the curriculum system is more perfect. AI technology and clothing elements are deeply integrated into the whole teaching process. The course content is highly adapted to the needs of regional clothing posts, and students ' learning enthusiasm and initiative are greatly improved. Second, the effectiveness of practical teaching has been significantly improved. The application of AI tools has compressed the time of inefficient practical operation. The training of practical projects has rapidly improved students ' practical ability, and students ' clothing design works have repeatedly achieved good results in various college skills competitions. Third, the quality of talent training has been steadily improved, graduates ' AI design skills and clothing practice ability are outstanding, and the degree of job adaptation has been greatly improved. Some graduates have successfully entered local clothing enterprises and become the backbone of industrial development. Fourth, the integration of production and education continues to deepen, school-enterprise cooperation moves from shallow docking to deep collaboration, and the ability of professional services to regional clothing development is significantly enhanced.

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