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Crossing Boundaries and Empowering with Digitalization: Construction and Pathways of Industry-Education Integration Model for Design Talent Cultivation

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Abstract: This research focuses on the deep integration of the industry-education integration concept and the "Three Practical's and Three Focuses" (actual practice, practical ability, competency, and focus, resource integration, collaborative effort), promoting the high-quality development of the integration of design talent education and industry through a series of measures. The study emphasizes the importance of improving the policy system, deepening school-enterprise cooperation, innovating talent training models, strengthening the construction of teaching staff, expanding international cooperation and exchanges, and constructing a scientific evaluation system. By crossing boundaries and leveraging digital empowerment, it aims to enhance the effectiveness of design education and industrial practice. The research proposes a "Boundary-Crossing and Digital Empowerment" model for the integration of design talent education and industry, including the construction of an information sharing and collaboration platform, optimization of curriculum systems and teaching content, deepening school-enterprise cooperation and industry-education integration, promoting the digital transformation of teaching staff, and improving evaluation and incentive mechanisms.By implementing these paths, it is expected to cultivate high-quality digital design talents that meet social needs, enhance students' comprehensive qualities and competitiveness, promote the effective connection between education chains, talent chains, industrial chains, and innovation chains, and achieve a win-win development for education and industry. This research not only has significant academic value, deepening the theory of industry-education integration and improving educational models, but also has important application value, enhancing the quality of talent cultivation, promoting industrial upgrading and innovation, and leading the modernization of education.

1. Introduction

With the rapid development of economic globalization and technology, the demand for talent in the design industry is becoming increasingly diverse and high-end. Traditional design education models tend to focus on theoretical knowledge transmission, neglecting the cultivation of students' practical abilities and innovative capabilities. Against the backdrop of industry-education

integration, this research aims to construct an efficient and practical integration model for the cultivation of design talent education and industry, enhancing the comprehensive qualities and competitiveness of design talent[1]. Boundary-crossing primarily refers to crossing the boundaries between traditional education and industry, as well as between the design field and other related fields.

Through cross-boundary cooperation, more diverse perspectives and resources can be introduced, promoting the expansion of design thinking and the enhancement of innovation capabilities.Design talents with practical abilities and innovative capabilities are more favored by enterprises[2]. As a talent training model that tightly integrates industry and education, the industry-education integration model can effectively enhance students' practical abilities and innovative capabilities, better adapting them to market demand, through deepening school-enterprise cooperation, jointly building training bases, and introducing industry mentors.

2. Issues in the Cultivation Model of Design Talent

The research objects of this topic primarily include design talent, industry-education integration models, intelligent technology, and the relationship between universities and enterprises. The specific research content will focus on how to integrate design, intelligent big data technology, and digital design education to construct an industry-featured integration cultivation model for industry-education integration.

2.1 Insufficient Interdisciplinary Integration Capability

Design students tend to be confined to their professional knowledge, lacking understanding of other disciplines such as computer science, business management, humanities, and social sciences. This limits their ability to apply interdisciplinary knowledge and methods when solving practical problems. This limitation not only affects the innovativeness and practicality of design works but also hinders the widespread application of design thinking in different fields.

2.2 Challenges in Precisely Aligning Curriculum Systems and Teaching Content with Market Demand and Technological Development Trends

When optimizing curriculum systems and teaching content, a challenge lies in ensuring that updated course content accurately aligns with current market demand and future technological development trends. This requires continuous market research and technological tracking, as well as close cooperation with industry associations and enterprises, to ensure the practicality and forward-looking nature of educational content. The mismatch between innovation ability and practical ability is also a significant issue faced by new liberal arts design talent. Although they usually possess abundant theoretical knowledge and innovative thinking, they often encounter obstacles when translating innovative ideas into actual design works.

3. Cross-boundary and Digital Empowerment Concepts and Practices

3.1 Cross-boundary Concept: Key Elements of Talent Cultivation Model

“Cross-boundary” primarily refers to crossing the boundaries between traditional education and industry, as well as between the design field and other related fields. Through cross-boundary cooperation, more diverse perspectives and resources can be introduced, promoting the expansion of design thinking and the enhancement of innovation capabilities. In the process of cultivating

design talent, cross-boundary cooperation can be embodied in the following aspects.

3.1.1 Interdisciplinary Integration

In the cultivation model of new engineering industrial design talent, interdisciplinary integration is an important approach to enhancing talent's comprehensive quality and innovation ability. By deeply integrating design disciplines with computer science, business management, and other disciplines, interdisciplinary talents with knowledge and comprehensive abilities can be cultivated. Interdisciplinary integration not only enriches students' learning content but also broadens their horizons, laying a solid foundation for their future career development.

3.1.2 School-enterprise Cooperation

School-enterprise cooperation is an important manifestation of industry-education integration and has significant implications for the cultivation of industrial design talent. By establishing close cooperative relationships with enterprises, universities can more accurately understand market demand and industry trends, thereby adjusting and optimizing talent cultivation programs. Enterprises can provide internship and training opportunities for students, allowing them to learn and grow through practice. At the same time, enterprises can jointly carry out project research and technological innovation with universities, applying the latest design concepts and technologies to actual projects, promoting industrial upgrading and innovative development.

4. Problem-solving Methods and Implementation Process

Educational institutions and enterprises need to work together to comprehensively improve the quality of new liberal arts design talent cultivation by optimizing curriculum systems, strengthening practical teaching, promoting interdisciplinary integration, enhancing digital technology application abilities, strengthening market demand research, and cultivating professional qualities and communication abilities. This will help cultivate more design talents with interdisciplinary integration abilities, matching innovation and practical abilities, proficiency in digital technology.

4.1 Optimize Curriculum Systems and Teaching Content

In response to market demand and technological advancements, The school has updated the curriculum systems and teaching content for design majors. This includes adding courses and practical training related to digital technology to enhance the overall competence and competitiveness of design talent. Through the industry-education integration model, students can gain access to more actual projects and enterprise resources, thereby improving their design abilities and innovative thinking through practice.

4.2 Deepen School-enterprise Cooperation and Industry-education Integration

The school will establish a dual-mentor system, inviting enterprise designers to serve as external mentors who jointly guide students alongside faculty members. Additionally, the school will collaborate with enterprises to build training bases and R&D centers, providing students with authentic practical environments and innovation platforms. This initiative drives the development of industry-education integration: The research results of this topic can provide reference and guidance for the industry-education integration of other majors, promoting the widespread application of the industry-education integration model.

4.3 Improve Evaluation and Incentive Mechanisms

The school constructs a diversified evaluation system that assesses students' applied and innovative competencies. It also establishes incentive mechanisms to stimulate proactive engagement in industry-education integration among faculty and students. These reforms collectively advance the modernization of design education: Integrating digital and intelligent technology into design education can drive the modernization process of education, improving education quality and efficiency. The school spearheads a comprehensive reform initiative to modernize design education through four synergistic strategies: Enhance teachers' digital literacy and information technology application abilities, introducing outstanding designers with rich practical experience to enrich the teaching staff.

5. Construction and Path of Industry-education Integration Cultivation Model

5.1 Digital Construction of Talent Cultivation Model

Based on the concepts of cross-boundary and digital empowerment, this research deeply explores and constructs a design talent industry-education integration cultivation model centered on “industry-education integration, cross-boundary cooperation, and digital empowerment.”This model aims to break the boundaries between traditional education and industry, introduce more diverse perspectives and resources through cross-boundary cooperation, and leverage digital technology for empowerment to cultivate high-quality design talent that meets market demand. This model primarily includes three aspects: curriculum system construction, practical teaching system, and school-enterprise cooperation mechanism.

5.1.1 Curriculum System Construction

Curriculum system construction is the foundation of talent cultivation model construction. To cultivate design talent with cross-boundary integration abilities and digital skills, we have constructed a curriculum system oriented toward market demand[3]. This system emphasizes the combination of theory and practice, aiming to enhance students' professional qualities and comprehensive abilities through systematic knowledge impartment and practical training. Industry-leading technologies and design concepts are introduced to ensure the novelty and practicality of course content. Secondly, we emphasize the modularization and flexibility of course content. Based on different professional directions and student interests, we have set up multiple course modules, including basic design modules, digital design modules, innovative design modules, etc. Finally, we have established a course evaluation and feedback mechanism. At the same time, we encourage students and teachers to jointly participate in course evaluations, forming a two-way feedback mechanism to promote the continuous improvement and perfection of the curriculum system.

5.1.2 Practical Teaching System

To enhance students' practical abilities and innovative thinking, we have established a comprehensive practical teaching system, including experimental courses, project training, enterprise internships, and other links. By participating in real design projects, students can understand the entire project management process, master design practice methods and skills, and enhance their abilities to solve practical problems. At the same time, project training can also help students establish a teamwork spirit and improve communication and coordination abilities.

5.1.3 School-enterprise Cooperation Mechanism

To realize resource sharing and complementary advantages, we have established close cooperative relationships with enterprises to jointly carry out talent cultivation, project research, and other activities. First, we jointly formulate talent cultivation programs with enterprises. Based on market demand and enterprise requirements, we jointly determine cultivation objectives, curriculum settings, practical links, etc., ensuring the pertinence and practicality of talent cultivation programs. Secondly, we jointly build practical teaching bases with enterprises. These practical teaching bases not only provide students with real practical environments but also promote in-depth exchanges and cooperation between schools and enterprises. Finally, we carry out joint project research activities with enterprises. By cooperating with enterprises, we jointly apply for and undertake scientific research projects, conducting technological research and application innovation. These joint projects not only help improve schools' scientific research levels and innovation abilities but also solve technological problems for enterprises, achieving win-win development.

5.1.4 Teacher Staff Construction and Evaluation System Mechanism Construction

The school has strengthened the development of its teaching faculty to enhance the professional competence and pedagogical skills of its teachers. To achieve this, it recruits outstanding designers with extensive practical experience to serve as full-time or part-time instructors. Furthermore, the school is establishing a diversified evaluation system and incentive mechanism to stimulate the enthusiasm and creativity of both teachers and students. This system specifically incorporates student competencies such as practical skills and innovative capabilities into its assessment criteria. Finally, the school recognizes and rewards outstanding individuals and teams through various incentives.

In summary, the design talent industry-education integration cultivation model constructed in this research, centered on “industry-education integration, cross-boundary cooperation, and digital empowerment,” effectively enhances the cultivation quality and social adaptability of design talent through the organic combination of curriculum system construction, practical teaching system, and school-enterprise cooperation mechanism. This model not only provides new ideas and methods for design education but also provides strong talent support for industrial development.

5.2 Path Implementation

This project proposes the following implementation pathways to ensure the smooth execution of the industry-education integration training model: First, it will develop a detailed implementation plan based on the training objectives and curriculum requirements. This plan will clearly define the goals, tasks, responsible parties, and timelines for each stage. Second, the project will enhance communication and collaboration with key stakeholders—including schools, enterprises, and industry associations—to build a cohesive force driving industry-education integration. Third, supervision and evaluation mechanisms will be strengthened through regular monitoring and assessment of integration efforts. This process enables prompt identification and resolution of issues, ensuring all activities progress according to plan. Finally, the initiative will foster exchanges and cooperation with other universities and enterprises to collectively advance the development of industry-education integration.

5.2.1 Educational Concept Innovation

In the cultivation of new engineering industrial design talent, the innovation of educational

concepts is the core driving force. First, interdisciplinary integration becomes crucial, meaning that the design discipline is no longer limited to traditional categories but actively seeks deep integration with mechanical engineering, computer science, business management, and other disciplines to construct a comprehensive knowledge system[4]. Secondly, the cultivation of innovation abilities is placed in an important position[5].By encouraging students to participate in scientific research innovation, entrepreneurial practices, and other activities, their innovative potential is stimulated, and their spirit of daring to explore and try is cultivated.

5.2.2 Modular Curriculum System Construction

To support the innovation of educational concepts, the curriculum system has also undergone corresponding modular construction. The professional module focuses on the core courses and cutting-edge technologies in the field of industrial design, enabling students to deeply understand and master the essence of the professional field through systematic learning and practice[6]. The innovation module, on the other hand, expands and deepens the first three modules, encouraging students to actively engage in scientific research innovation and entrepreneurial practices, cultivating their innovative consciousness and entrepreneurial abilities. These four modules support each other and progress layer by layer, collectively constituting the curriculum system for cultivating new engineering industrial design talent.

6. Conclusion

Through in-depth research and practical exploration of the industry-education integration design talent cultivation model, this research has clarified the important role of industry-education integration in cultivating high-quality design talent. Through the industry-education integration model, students can gain access to more actual projects and enterprise resources, enhancing their design abilities and innovative thinking through practice. At the same time, cross-boundary cooperation and digital empowerment have become key factors in improving the quality of design education, introducing diverse perspectives and resources, promoting the expansion of design thinking and the enhancement of innovation abilities, and leveraging digital technology to provide more diverse and efficient tools and methods for design, changing the presentation and dissemination channels of design works.Through a diversified evaluation system and incentive mechanism, the enthusiasm and creativity of teachers and students can be stimulated, promoting the effective implementation of industry-education integration work.

This research plans to further deepen the research and practice of the industry-education integration design talent cultivation model. At the same time, it will continuously innovate and optimize the curriculum system and teaching content, keeping up with market demand and technological development, introducing cutting-edge technologies and design concepts to enhance students' comprehensive qualities and competitiveness. In addition, it will promote the construction and application of intelligent teaching platforms, leveraging artificial intelligence and big data technology to provide personalized learning resources and tutoring services, improving teaching effectiveness.

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