Article

Research on the Reform of Industrial Design Talent Training Model Oriented by Innovation Ability

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Abstract: This study explores the reform of the industrial design talent training model oriented by innovation ability. With the rapid advancement of technology and industry, the demand for innovative design talents has been steadily increasing. Traditional talent training models face challenges such as a disconnect with industry needs, insufficient cross-disciplinary collaboration, and outdated course content. To address these issues, this study proposes an optimized model based on industry-education integration, focusing on strengthening school-enterprise cooperation, adjusting curriculum design, promoting cross-disciplinary collaboration, and dynamically updating teaching content to enhance students' innovation and practical abilities. The research shows that cultivating innovation ability is key to improving the quality of industrial design education and students' overall capabilities. Future talent training models should align more closely with industry demands and strengthen the development of innovative thinking and practical skills.

Keywords: innovation ability; industrial design; talent training; industry-education integration; educational reform

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1. Introduction

With the rapid advancement of technology and evolving market demands, the field of industrial design has undergone significant transformation. Modern industrial designers are expected not only to master fundamental design skills but also to demonstrate strong innovation capabilities, interdisciplinary knowledge, and problem-solving abilities to address increasingly complex challenges. However, many current talent cultivation models in industrial design education remain heavily focused on the transmission of theoretical knowledge, often neglecting the development of practical innovation skills. This imbalance has created a noticeable gap between academic training and the real needs of industry, limiting graduates' ability to effectively apply creative thinking and hands-on skills in professional settings [1].

Traditional teaching methods typically emphasize lecture-based instruction with insufficient integration of project-driven learning and real-world industrial experience. As a result, students have limited opportunities to engage in authentic design projects, prototype development, and user-centered design processes. This deficiency restricts their innovative thinking and practical abilities, which are essential for adapting to the fast-paced and interdisciplinary nature of today's industrial environment. Furthermore, in an era marked by rapid industrial changes, students must cultivate stronger interdisciplinary collaboration skills and the ability to solve complex problems to remain competitive [2].

In response to these challenges, the industrial design program has actively explored teaching reform pathways oriented toward cultivating students' innovation capabilities.

By optimizing curriculum structures, introducing project-based teaching methods, and strengthening industry-education integration, efforts have been made to establish a systematic and diversified talent cultivation system. Such approaches are designed to effectively enhance students' innovative literacy and practical skills. These reforms aim to better align industrial design education with current industrial demands and prepare graduates who are capable of contributing innovatively to their fields [3].

2. Theoretical Foundation and Research Progress on Innovation Capability Cultivation

2.1. Theoretical Foundations of Innovation Capability Cultivation

Innovation capability, as a driving force for social development and technological advancement, has become a core objective in higher education, particularly in the cultivation of talents within industrial design programs. Scholars have extensively explored the connotation and cultivation pathways of innovation capability, forming a multidimensional and multilayered theoretical framework. Traditionally, innovation capability was viewed as the individual's ability to generate new ideas, products, or methods. However, with the development of interdisciplinary fields and information technology, the definition has expanded to encompass cognitive abilities, emotional attitudes, and social interactions as integral components of innovation competence [4].

Current mainstream theories emphasize the systematic cultivation of innovation capability, focusing on the coordinated development of knowledge, skills, and attitudes. Cognitive psychology suggests that innovative thinking requires a combination of divergent and critical thinking; educational theories highlight the role of project-based learning in authentic contexts to stimulate students' innovative potential; design thinking theories focus on user-centered and iterative problem-solving processes. Moreover, the advent of the digital age has introduced information technology and artificial intelligence as important tools in innovation cultivation, offering new approaches for personalized learning and interdisciplinary collaboration.

2.2. Current Status of Talent Cultivation Models in Industrial Design

Talent cultivation in industrial design has traditionally focused on imparting theoretical knowledge and technical skills. While this foundation remains important, the increasing complexity of modern industrial environments calls for a more comprehensive approach. Current training models are gradually shifting toward fostering a broader set of competencies, including critical thinking, collaboration, and adaptability. This evolution aims to prepare students not only to master design techniques but also to navigate interdisciplinary challenges and respond to rapid technological changes.

Despite these efforts, many existing cultivation models still encounter limitations. There is often insufficient integration between theoretical learning and practical application, leading to gaps in students' hands-on experience and innovative capacity. Additionally, limited opportunities for real-world industry exposure restrict students' understanding of current market and production demands. The emphasis on creativity and innovation also varies widely across programs, resulting in uneven development of students' innovative abilities. These challenges underline the necessity of continued reform and optimization of industrial design education to better align with professional requirements [5].

2.3. Theories of Industry-Education Integration and Project-Based Teaching

Industry-education integration has become a pivotal approach in modern vocational and higher education, aiming to bridge the gap between academic learning and practical industry needs. This approach emphasizes collaboration between educational institutions and enterprises to create authentic learning environments that enhance students' professional skills and innovation capabilities. Theoretical foundations for industry-education integration draw from human capital theory, which highlights the importance of practical skills for economic development, and communities of practice theory, which stresses learning as a social process occurring through participation in real work settings.

Project-based teaching, as a key pedagogical method aligned with industry-education integration, centers on student engagement through real-world projects. This method fosters active learning by situating knowledge acquisition within meaningful, context-rich tasks. The underlying educational theories include constructivism, which advocates for learners constructing knowledge through experience, and experiential learning theory, emphasizing reflection on doing as a path to deeper understanding. In industrial design education, project-based teaching encourages interdisciplinary collaboration, iterative problem solving, and user-centered design, all crucial for cultivating innovation capabilities [6].

By combining industry-education integration with project-based teaching, educational programs can provide students with authentic, practice-oriented learning experiences that develop both technical proficiency and innovative thinking. This synergy supports the development of a systematic and diversified talent cultivation system responsive to the evolving demands of the industrial design field.

3. Current Status and Challenges of Industrial Design Talent Cultivation Models

3.1. Overview and Analysis of Current Industrial Design Talent Training Models

Industrial design education models currently emphasize foundational theoretical knowledge, technical skill training, and practical project experience as the core components of talent cultivation. These models vary significantly across different institutions, shaped by factors such as regional industrial characteristics, institutional capabilities, and educational philosophies. In many programs, traditional curricula prioritize basic design principles, material technologies, computer-aided design tools, and craft skills, aiming to build students' solid technical foundations, as illustrated in Table 1.

Table 1. Analysis of Current Industrial Design Talent Cultivation Models.

Training Model	Main Features	Current Challenges	Alignment with Industry Needs
Traditional Model	Focuses on theoretical knowledge with limited practical components	Lack of practical experience, outdated course content	Poor alignment with modern industry needs
Industry-Education Integration Model	Cooperation with enterprises, more practical projects	Uneven participation from enterprises, limited interdisciplinary collaboration	Generally aligned with industry development, but still has gaps
Innovation-Oriented Model	Focuses on cultivating innovation and design thinking	Insufficient innovation training resources, lack of systematic integration	Needs further integration with cutting-edge technology and practice

However, the rapid evolution of industrial sectors and the growing complexity of design challenges require more than just fundamental skills. Some leading institutions have begun to incorporate interdisciplinary courses that blend engineering, marketing, ergonomics, and user experience design to better reflect industry realities. Additionally, there is increasing adoption of project-based and problem-oriented learning methods that simulate real-world design processes, encouraging students to develop practical problem-solving abilities.

Despite these advances, a considerable number of programs still rely heavily on conventional lecture-based teaching and compartmentalized knowledge delivery. This approach often limits students' exposure to cross-disciplinary collaboration and innovation-driven thinking, which are crucial in today's competitive design environment. Moreover, the alignment between curriculum content and the fast-changing demands of industry innovation remains uneven, resulting in gaps between graduate capabilities and employer expectations.

In summary, while existing talent cultivation models provide a necessary foundation for industrial design education, ongoing reforms are essential to enhance their responsiveness to industry innovation trends and to cultivate versatile, creative professionals equipped for the challenges of the modern design landscape.

3.2. Challenges in Interdisciplinary Integration

Industrial design increasingly demands interdisciplinary knowledge and collaboration, requiring integration across fields such as engineering, computer science, business, psychology, and user experience. This integration is essential to address the multifaceted nature of modern design problems, which often involve technical feasibility, market viability, and user-centered considerations simultaneously. However, many existing talent cultivation models face significant challenges in achieving effective interdisciplinary integration.

Firstly, traditional curricula are often organized in disciplinary silos, with limited opportunities for students to engage in cross-disciplinary learning. This fragmentation restricts their ability to develop holistic design thinking and limits exposure to diverse perspectives necessary for innovative solutions. Furthermore, faculty expertise and institutional resources may not always support interdisciplinary teaching, making collaborative curriculum development and delivery difficult.

Secondly, students frequently lack platforms and structured opportunities to practice interdisciplinary teamwork. Real-world industrial projects typically require collaboration among professionals with different expertise, yet educational settings may not adequately simulate these environments. Without such experiences, students may struggle to develop communication skills, collaborative problem-solving abilities, and an appreciation for different disciplinary approaches.

Lastly, assessment methods in many programs remain focused on individual performance and disciplinary knowledge, which can undermine the motivation for interdisciplinary engagement. To overcome these challenges, educational institutions need to redesign curricula, promote faculty collaboration, establish cross-disciplinary projects, and adopt assessment strategies that value teamwork and integrative thinking.

Addressing these interdisciplinary integration challenges is crucial to cultivating industrial design talents capable of navigating complex, real-world design scenarios and driving innovation in a rapidly evolving industry landscape [7].

3.3. Gap Between Academic Training and Industry Practice

A significant challenge facing industrial design education is the disconnect between academic training and the practical demands of industry. While academic programs often emphasize theoretical knowledge and controlled project work, students frequently have limited exposure to real-world industrial environments and contemporary production processes. This gap hinders their ability to fully understand the complexities and constraints present in professional practice.

One reason for this divide is the insufficient collaboration between educational institutions and industry partners. Many programs lack robust partnerships with enterprises that could provide internships, live projects, or joint research opportunities.

Without these practical experiences, students miss chances to apply classroom knowledge to actual design challenges, develop professional work habits, and gain insights into market trends and user needs.

Moreover, rapid technological advancements and evolving production techniques in the industry require continuous updates in educational content and methods. However, curricula may lag behind current industrial practices, resulting in graduates whose skills and knowledge are not fully aligned with employer expectations. This misalignment reduces graduates' immediate employability and their capacity to contribute to innovation upon entering the workforce [8].

Bridging this gap necessitates strengthening school-industry collaboration, integrating real-world projects into the curriculum, and fostering ongoing communication between educators and industry professionals. Such efforts can enhance the relevance and applicability of industrial design education, better preparing students for the complexities of modern professional environments.

3.4. Insufficient Emphasis on Innovation and Creativity

Innovation and creativity are critical competencies for industrial design professionals, enabling them to develop novel solutions that meet evolving market and user needs. However, many existing industrial design education programs place disproportionate emphasis on mastering established techniques and technical skills, often at the expense of fostering creativity and innovative thinking.

This imbalance can stem from curriculum designs that prioritize standardized knowledge and technical proficiency over open-ended exploration and risk-taking. As a result, students may become adept at reproducing known design patterns but lack opportunities to experiment, challenge assumptions, or develop original ideas. Furthermore, assessment methods frequently focus on measurable outcomes such as technical accuracy, which may undervalue creative processes and divergent thinking.

Additionally, the limited integration of interdisciplinary perspectives and real-world problem contexts further constrains the cultivation of innovation. Without exposure to diverse fields and authentic challenges, students' creative capacities may remain underdeveloped [9].

To address these issues, educational institutions need to redesign curricula to include innovation-centered courses, promote exploratory learning environments, encourage cross-disciplinary collaboration, and implement assessment strategies that recognize creativity and experimentation. Strengthening these aspects will better equip industrial design students to become innovative practitioners capable of driving the future development of the field.

4. Innovation Capability-Oriented Teaching Reform Strategies

4.1. Curriculum Structure Optimization for Innovation

To cultivate innovation capability effectively, curriculum optimization must transcend the traditional knowledge transfer model and embrace an integrated, competency-based approach. This involves restructuring courses to blend foundational theories with interdisciplinary knowledge, such as engineering principles, business strategy, user experience, and emerging technologies like AI and IoT. Adopting a modular course design allows for greater flexibility, enabling students to follow learning pathways tailored to both industry demands and personal interests.

Moreover, embedding innovation-related content throughout the curriculum, rather than confining it to isolated courses, helps to consistently nurture an innovation mindset. Essential elements such as design thinking, creativity techniques, and critical reflection should be integrated across various subjects to enhance students' abilities to ideate, prototype, and iterate effectively. Assessment methods, too, must evolve to focus not just on technical skills, but also on creativity, problem-solving, collaboration, and adaptability, which are all crucial competencies in the modern industrial design landscape.

To summarize these points, Table 2 outlines the key focus areas and strategies for optimizing the curriculum to foster innovation:

Table 2. Curriculum Structure for Innovation.

Focus Area	Key Objectives	Strategies for Achieving Innovation
Curriculum Framework	Move from traditional knowledge transfer to competency-based learning.	Blend core theories with interdisciplinary content like engineering, business strategy, and emerging technologies.
Course Design	Modular, flexible, student-centered curriculum.	Include cross-disciplinary fields such as AI, IoT, and user experience design.
Innovation Integration	Foster innovation throughout the curriculum.	Weave design thinking, creativity techniques, and critical reflection into all courses.
Assessment Evolution	Shift focus from technical skills to a broader evaluation.	Assess creativity, problem-solving, collaboration, adaptability alongside technical expertise.

This approach ensures that students are equipped with the diverse set of skills required to meet the challenges of modern industrial design and remain adaptable to future technological advancements.

4.2. Project-Based and Experiential Learning Implementation

Project-Based Learning (PBL) is a cornerstone of innovation-driven education, fostering active engagement and real-world problem-solving. Effective PBL implementation requires projects that reflect authentic industry challenges, encouraging interdisciplinary collaboration among students from diverse backgrounds. This approach promotes higher-order thinking skills, including analysis, synthesis, and evaluation.

Structured mentorship by faculty and industry experts is essential to guide students through iterative design cycles and reflective practices. Incorporating formative feedback mechanisms supports continuous learning and improvement. Additionally, leveraging digital platforms and virtual collaboration tools can extend project experiences beyond the classroom, facilitating cross-regional teamwork and access to diverse expertise.

Experiential learning extends beyond projects to include internships, workshops, competitions, and maker spaces, providing hands-on opportunities to test ideas and refine skills in authentic contexts. Such experiences are crucial for bridging theory and practice, fostering entrepreneurial spirit, and building professional networks [10].

4.3. Enhancing Industry-Education Integration and Collaborative Innovation

Robust industry-education integration aligns academic training with real-world needs and accelerates innovation capacity development. Establishing long-term partnerships with local and regional industries allows for co-creation of curriculum, joint research, and co-supervised student projects. These collaborations enable timely curriculum updates reflecting technological trends and market demands.

Creating innovation hubs, incubation centers, and living labs within academic institutions cultivates ecosystems where students, faculty, and industry professionals collaborate on cutting-edge design challenges. These platforms support cross-disciplinary teams, prototyping facilities, and access to funding and entrepreneurship resources.

Furthermore, industry participation in governance and advisory roles ensures education programs remain relevant and responsive. Encouraging industry experts to deliver guest lectures, workshops, and mentorship enriches the learning environment and exposes students to professional standards and expectations.

Institutional support for faculty-industry exchanges and professional development fosters educators' awareness of industry dynamics, enhancing their teaching and research capabilities related to innovation.

5. Optimization and Practice of Talent Cultivation Models for Innovation Capability

5.1. Case Study: Talent Cultivation Program Practice Aligned with Local Industrial Needs

In response to the rapid development of manufacturing and cultural and creative industries in Urumqi, an industrial design program at a vocational college has promoted the cultivation of innovation capabilities through teaching reform. The school rebuilt its curriculum system based on the characteristics of local industries, especially the needs in mechanical manufacturing, textiles, and cultural and creative industries, and conducted in-depth explorations in project-based teaching and industry-education integration.

1) Curriculum System Optimization and Industry Alignment

The curriculum design focuses on integrating basic design theory with practical application, precisely aligning with the locally characteristic manufacturing and cultural creative industries. To enhance students' awareness of regional culture, a course titled "Local Culture and Product Design" was offered, combining local traditional culture with modern design concepts. In addition, a new course "Intelligent Manufacturing and Industrial Design" was introduced, enabling students to master cutting-edge trends in digital technology, the Internet of Things, and intelligent production.

Moreover, the school strengthened cooperation with local manufacturing enterprises, inviting enterprise engineers and technicians to serve as course lecturers or project mentors. Through this approach, students not only gain first-hand technical information from the industry but also directly participate in the design process of actual projects. For example, the school cooperated with a local mechanical manufacturing enterprise to design a mechanical product integrating intelligent control and modern craftsmanship, with students involved in the entire process from needs analysis to prototype testing.

2) Project-Based Teaching and Interdisciplinary Collaboration

Project-based teaching is the core content of the school's reform. The school cooperated with multiple local cultural and creative enterprises, integrating local folk culture with modern design concepts to provide students with diversified design projects. In these projects, students are required to collaborate with peers from different majors, such as marketing and user experience design, to jointly complete product designs. Through this interdisciplinary cooperation, students' thinking horizons are broadened, and their ability to solve complex project problems is improved.

For example, in a cultural and creative product design project, students combined local traditional patterns with modern materials to design a home product featuring Xinjiang cultural characteristics. This product successfully attracted attention in the local market and became a highlight among cultural and creative projects.

3) Industry-Education Integration and Industry Feedback

Industry-education integration is an important feature of this cultivation program. The school has established long-term cooperative relationships with multiple local enterprises, providing students with abundant opportunities for enterprise internships and social practice. In the "Enterprise Joint Innovation Workshop," enterprises put forward specific project requirements, and students design according to industry standards, with enterprise experts guiding and evaluating the projects throughout. This cooperation ensures that students learn cutting-edge technologies and gain practical experience in real projects.

Feedback from enterprises indicates that students possess strong market adaptability and innovative thinking, can quickly adapt to the workplace environment, and provide innovative design solutions for enterprises. Especially in the cultural and creative industries, some student-designed products have been adopted and put into production by enterprises.

4) Student and Social Responses

This reform has not only enhanced students' innovative thinking and practical abilities but also strengthened their teamwork and project management skills. Students reported that project-based teaching greatly improved their practical operation skills and their ability to handle complex problems. In addition, the participation and timely feedback from enterprise mentors helped them better understand industry needs and enhanced their professional quality.

The program's implementation has been highly recognized by all sectors of society, generally considered to effectively meet local industrial development needs and cultivate a large number of innovative talents for regional economic transformation and upgrading.

5) Challenges and Directions for Improvement

Despite achieving certain results, there are still some challenges during implementation. For example, the participation of some enterprises is not high, resulting in limited industry practice opportunities for students; in interdisciplinary cooperation, students still face difficulties in communication and collaboration, especially in the integration of knowledge areas. In addition, the time lag between curriculum updates and industry development still exists, and some technical content has not yet timely reflected the latest industry trends.

In the future, the school plans to further strengthen school-enterprise cooperation, expand enterprise cooperation channels, and increase industry demand feedback on curriculum settings. Meanwhile, it will optimize interdisciplinary collaborative teaching models and promote more enterprises' participation in curriculum design and evaluation to better adapt to the rapid changes in industrial demands.

5.2. Advantages and Outcomes of the Talent Development Model

Through the implementation of this talent development model, initial results have been achieved in several areas, demonstrating its feasibility. Not only has it enhanced students' innovative capabilities and practical skills, but it has also helped students better adapt to the rapidly evolving industry demands, providing strong talent support for local industries' innovation and transformation.

Firstly, the optimization of the curriculum system has effectively enhanced students' innovative capabilities. By combining foundational design theory with practical application, students have not only mastered solid design fundamentals but have also kept up with the development of emerging fields such as intelligent manufacturing, digital technologies, and the Internet of Things. This interdisciplinary integration has improved students' overall quality and laid a solid foundation for their future career development [11].

Secondly, the effective combination of project-based teaching and industry-education integration has provided students with abundant practical opportunities, strengthening their hands-on skills and teamwork abilities. Through collaboration with local enterprises, students have been able to experience the design process in real work environments, from needs analysis to design solutions and prototype testing, fully exercising their innovative thinking and problem-solving abilities. Additionally, interdisciplinary collaboration has broadened students' perspectives, enhancing their ability to solve complex problems in multifaceted projects.

Furthermore, industry feedback resulting from the integration of industry and education has significantly promoted the update and optimization of educational content. Through long-term cooperation with enterprises, the school has been able to stay abreast of industry development trends and needs, allowing for timely adjustments to course content. This has not only enhanced students' employability but has also enabled them to quickly adapt to the fast-developing industrial environment, injecting fresh innovative energy into enterprises.

However, despite the significant achievements, certain challenges still exist. For example, the low level of participation from some enterprises has limited the practical opportunities students receive in real projects. Additionally, communication and integration issues still exist in interdisciplinary collaboration, particularly in terms of knowledge integration between different disciplines. Therefore, in the future, efforts will be made to further strengthen school-enterprise cooperation, optimize course design, encourage greater enterprise involvement in course development and evaluation, and adopt innovative collaboration models to further enhance students' practical skills and innovative capabilities.

5.3. Challenges and Improvement Directions

Although this talent cultivation model has achieved initial results in several aspects and has provided a solid platform for the enhancement of students' innovation abilities and practical skills, there are still some challenges and issues encountered during its actual implementation. The following are the main difficulties encountered and the directions for future improvement.

Firstly, the insufficient participation of enterprises remains one of the key factors restricting the further development of this model. Although the school has established cooperative relationships with some local enterprises and has achieved good integration between education and industry in certain projects, the depth and breadth of enterprise involvement are still limited, and students' opportunities for practical experience in real projects are somewhat restricted. To address this issue, future efforts should further strengthen cooperation with leading and innovative enterprises in the industry, expand the scope of cooperation, especially in high-tech fields, and provide more opportunities for students to engage in real industry environments through customized course development and the provision of additional practical platforms.

Secondly, communication and integration issues in cross-disciplinary collaboration have also, to some extent, affected students' learning outcomes and the progress of projects. Students from different academic backgrounds often face obstacles in language, knowledge frameworks, and communication methods during collaboration, leading to uneven progress in project implementation and, in some cases, impacting project quality. To solve this problem, the school can enhance the design and coordination of cross-disciplinary courses, promote the integration of multi-disciplinary knowledge, and provide students with team collaboration training within the curriculum. Furthermore, organizing specialized cross-disciplinary seminars and workshops to improve students' ability to communicate and collaborate across fields will help break down barriers between disciplines.

Additionally, the issue of course content updating and its alignment with industry developments remains a challenge. In a rapidly evolving industrial environment, technology and market demands change daily, and some course content has not yet reflected the latest industry trends in a timely manner. To address this, the school needs to establish a more flexible curriculum update mechanism by strengthening regular communication and collaboration with industry experts to ensure that course content stays aligned with cutting-edge technologies. Moreover, inviting industry professionals to participate in course evaluations and textbook updates periodically will ensure that educational content remains consistent with industry needs.

Finally, the further development of students' innovative capabilities is a key aspect that cannot be overlooked in current and future talent cultivation efforts. Although the existing courses and teaching models have initially fostered students' innovative thinking and practical abilities, how to stimulate students' full creative potential-especially when faced with complex industrial innovation tasks-remains an ongoing challenge. Future efforts could include strengthening design thinking courses, introducing innovation methodologies, and increasing the number of entrepreneurial practices and innovation competitions to further cultivate students' creativity and cross-disciplinary thinking, thereby producing more high-quality design talent for industrial innovation.

In summary, although this talent cultivation model has achieved certain results, challenges such as insufficient enterprise participation, cross-disciplinary collaboration issues, and lagging course content updates still remain. Future efforts should focus on further strengthening school-enterprise cooperation, optimizing course design, promoting cross-disciplinary collaboration, and accelerating updates to educational content to ensure that talent cultivation aligns closely with industry demands. This will further enhance students' innovative and practical capabilities, providing more robust talent support for the innovation and development of local industries.

5.4. Future Development Directions and Improvement Measures

To ensure the sustainability and effectiveness of this talent cultivation model, continuous optimization and improvement are required in the future. The following are the prospects for future improvement directions:

1) Strengthen In-Depth School-Enterprise Cooperation and Promote the Deep Integration of Education and Industry

Although there is already a certain foundation of school-enterprise cooperation, the integration of education and industry still needs to be further deepened. In the future, efforts should be made to deepen school-enterprise cooperation by:

Expanding the breadth and depth of industry partners: Strengthen cooperation with well-known enterprises, innovative enterprises, and small and medium-sized enterprises in the industry, establishing a more extensive and closer industrial cooperation network, especially focusing on high-tech and high-value-added industry fields.

Joint research and customized course development: Schools and enterprises should jointly develop industry-relevant courses and textbooks. Customized course content that closely aligns with industry demands can keep pace with the development of enterprises. This cooperation will not only enhance students' practical skills but also promote enterprises' talent cultivation and recruitment.

Establishing enterprise practice bases: By establishing more off-campus practice bases or cooperative laboratories, students will have more opportunities to practice in a real business environment, stay updated with industry trends, and apply theoretical knowledge to real-world work scenarios.

2) Strengthen Cross-Disciplinary Collaboration and Comprehensive Ability Development

Cross-disciplinary collaboration and the cultivation of comprehensive abilities are important directions for future educational reforms. Specific measures include:

Optimizing Course Design: Improve existing courses, encourage more interdisciplinary integration, especially between design and technology, design and business, design and user experience, etc., to cultivate students' comprehensive thinking and a holistic perspective.

Cross-Disciplinary Project Practice: In project-based teaching, encourage students from different academic backgrounds to collaborate and form interdisciplinary teams to solve problems from different perspectives and fields. Through such collaboration, students will better understand other disciplines' professional knowledge and skills and improve their problem-solving capabilities.

Strengthening Soft Skills Development: In addition to technical and professional knowledge, future education should place more emphasis on cultivating students' communication, coordination, teamwork, and leadership skills, which are crucial for the successful implementation of cross-disciplinary projects.

3) Stay Ahead of Industry Development Trends and Drive Dynamic Updates to Course Content and Teaching Materials

The rapid development of industry technology requires that educational content and methods be updated in a timely manner to remain consistent with industry demands. To achieve this, the school should:

Build a Flexible Curriculum Update Mechanism: Regularly invite industry experts, technical leaders from enterprises, etc., to participate in course evaluations and update the content and textbooks based on industry development trends and technological innovations.

Focus on Cutting-Edge Technologies and Trends: Course designs should include more content on cutting-edge technology areas, such as artificial intelligence, the Internet of Things, big data, and cloud computing, and incorporate practical teaching that allows students to interact with these emerging technologies, equipping them to address future industry challenges.

Introduce Flexible Teaching Models: In addition to traditional classroom teaching, actively introduce online learning platforms, virtual simulation technologies, and internships to increase teaching flexibility and interactivity, providing students with more diverse learning options.

4) Enhance Students' Innovative Abilities and Cultivate Entrepreneurial Spirit

Innovation abilities and entrepreneurial spirit are key drivers of future industrial development. Schools should further emphasize cultivating students' innovative thinking and entrepreneurial abilities:

Increase Innovation Practice Projects: Schools can stimulate students' innovative thinking by organizing innovation design competitions, entrepreneurship challenges, and industry case analyses, helping them develop creative problem-solving abilities.

Provide Entrepreneurial Support Platforms: Set up innovation and entrepreneurship incubation platforms to help students transform ideas into actual products or projects. By providing entrepreneurship mentorship, funding support, and market resources, students can realize the transformation from ideas to products.

Cultivate Cross-Disciplinary Innovation Thinking: Encourage students to think across disciplines, combining knowledge from different fields to promote breakthroughs in innovative results. For example, design students can collaborate with students from computer science, materials, and engineering to develop innovative products and technologies.

5) Enhance International Vision and Expand Global Education

As globalization progresses, talent cultivation models should have an international perspective. To achieve this, schools can:

Strengthen International Cooperation and Exchange: Cooperate with high-level foreign universities and enterprises to carry out academic exchanges, internships, and joint research projects, enhancing students' international competitiveness and global vision.

Build an International Curriculum System: Introduce internationally advanced design concepts and methods to cultivate students' global design abilities. Through course settings, international exchange programs, etc., students can be equipped with cross-cultural understanding and international communication skills, preparing them for global competition.

6) Continuously Focus on Educational Assessment and Quality Assurance

To ensure the continuous improvement of educational quality, a comprehensive teaching evaluation and quality assurance mechanism should be established:

Regular Evaluation and Feedback Mechanism: Regularly assess teaching quality, including course content, teaching methods, and student feedback, to identify issues and make timely adjustments.

Multi-Dimensional Quality Assurance System: Establish a multi-dimensional quality assurance system covering teachers, courses, and enterprise feedback to ensure that educational content, teaching outcomes, and industry needs are closely aligned, continuously improving students' overall competence and innovation abilities.

In the future, continuous optimization and innovation of talent cultivation models need to focus on deepening school-enterprise cooperation, promoting cross-disciplinary collaboration, updating curricula, and fostering students' innovative abilities. By strengthening the integration of education and industry, providing more practical and innovative opportunities, schools can offer stronger support for local industry transformation while cultivating more high-quality talent that meets industry needs.

5.5. Applicability and Promotion Potential

The talent cultivation model has adaptability and can be appropriately adjusted according to the characteristics of different institutions, disciplines, and regions. When promoting this model in other institutions or disciplines, it is necessary to consider the specific educational background and industry needs. For example, in disciplines such as design, engineering, and management, course content and practical components can be adjusted according to the characteristics of the discipline to better align with industry demands and cultivation goals. When promoting in different regions, especially in areas with significant urban-rural disparities, it may be necessary to flexibly adjust course design and industry-education integration to ensure alignment with local economic characteristics and industrial development needs.

In terms of promotion potential, with the continuous growth of societal demand for innovative talents, this model has considerable potential for promotion. Although the situation varies across regions and institutions, the model can be flexibly applied according to actual needs and thus has the potential to be promoted in more institutions, enterprises, and regions. In particular, in sectors such as manufacturing and cultural creative industries, relevant institutions and enterprises can adopt this model, adjusting courses and practical components to cultivate high-quality talents who meet industry demands. Furthermore, government policies and industry support provide backing for the further promotion of this model. Through policy guidance and the promotion of industry demands, this model is expected to be widely promoted and have a positive impact in the future.

6. Conclusion

This study focuses on the reform of the talent cultivation model for industrial design professionals, guided by the goal of fostering innovative abilities. The key analysis is how to promote students' innovation capabilities through the integration of industry and education. By evaluating the existing cultivation model and suggesting improvements, the study reveals that the current model still has certain shortcomings in fostering innovative abilities, particularly in aligning with industry needs, cross-disciplinary collaboration, and course updates.

As a key reform strategy, industry-education integration plays a crucial role in cultivating innovative abilities. Strengthening cooperation between schools and enterprises not only provides students with more practical opportunities but also helps them keep up with industry technological developments, enhancing their innovation awareness and application abilities. The deepened integration of industry and education can effectively bridge the gap between school education and industry needs, offering students more diversified learning platforms, thus promoting the comprehensive development of their innovative thinking and design capabilities.

However, the study also points out several challenges that may arise during implementation, such as insufficient enterprise involvement, lagging course updates, and communication issues in cross-disciplinary collaboration. To further improve the talent cultivation model, future efforts should focus on increasing school-enterprise cooperation, optimizing course design, enhancing cross-disciplinary collaboration and team training, and promoting dynamic updates of educational content to ensure that the cultivation model can adapt to the rapidly evolving industry demands, particularly in high-tech fields.

The conclusions of this study not only provide theoretical support for educational reforms in industrial design but also offer practical guidance for the talent cultivation models of more institutions and regions in the future. As the demand for innovative design talents continues to grow, the industry-education integration model is expected to be promoted in a wider range of fields, cultivating high-quality design talents with an international perspective for the innovation and development of local industries.

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