

Reform and Practice of Cultivation Mode of Top Talents in Product Design Specialty under the Background of Industry-Teaching Integration

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Abstract. In the wave of globalization and informationization, the demand for top talents in the field of product design is increasingly urgent. This study delves into the reform path of cultivating top talent in product design against the backdrop of industry-teaching integration, addressing issues with weak practical teaching, lagging curriculum content, and a lack of practical experience among teachers in the field of product design education. The study clarifies the connotation of industry-teaching integration and its application value in product design education, and then, based on the theory of cultivation of top-notch talents, puts forward a multi-dimensional reform plan such as optimization of the curriculum system, strengthening of practical teaching, construction of the platform for industry-teaching integration and construction of the teaching staff, which provides valuable references to the educational reform of other related majors.

Keywords: Integration of industry and education; Product Design Major; Cultivating top talents; School-enterprise cooperation.

The rapidly evolving landscape of globalization and information technology is bringing about unparalleled transformations in the field of product design. This change puts forward higher and more comprehensive requirements for product design talents, making the demand for talents present a dual trend of diversification and specialization. Currently, product design education is facing many problems that need to be solved, such as curriculum content lagging behind the development of industry, weak practical teaching links, and insufficient practical experience of faculty, etc. These problems seriously restrict the quality improvement of product design education and optimization of the effect of talent cultivation.

1. Overview of Industry-Education Integration Cultivation for Top Talents of Product Design Specialties

The reform of the top talent's cultivation mode in the product design specialization seems to be essential in the context of education and industry integration. Through in-depth analysis of the connotation and mode of industry-teaching integration, as well as its specific application in product design professional education. This reform initiative is critical to improving the efficacy and relevance of professional education in product design. It also offers robust support for the development of exceptional product design talent with a spirit of innovation and practical ability.

1.1 Overview of Relevant Domestic Research

Throughout the relevant studies at home and abroad, many scholars have carried out useful explorations on the talent cultivation mode under the background of the integration of industry and education. Finding a local applied colleges and universities to meet the demands of businesses in the talent training mode, for instance, requires a thorough analysis of the talent supply-demand interface issue and the primary causes of the existence of a wide range of "integration of industry and education, school-enterprise cooperation" countermeasures[1]. Taking the product design major as an example, other researchers have explored the "personalized and differentiated" teaching and training mode in the context of industry-teaching-research integration, aiming to improve students' comprehensive quality and innovation ability through personalized teaching design and

differentiated training paths[2]. Other researchers have explored the construction and practice of the applied talent training mode of product design from the perspective of “industry-university-research-use-creation”. The study builds a systematic, complete, collaborative and innovative talent cultivation mode system by integrating resources from industry, academia, research, application and creation, which provides new ideas and methods for talent cultivation of product design majors[3]. In the meantime, some researchers have also examined the process of developing highly creative talent for industrial design majors, using local universities as an example in the context of emerging engineering specialties. In light of the new requirements and challenges faced by industrial design majors in the context of new engineering disciplines, the study proposes target positioning, path selection, and safeguard measures for the cultivation of top-notch innovative talents. This is extremely important because it provides guidance for promoting the innovative development of industrial design majors and improving the caliber of talent cultivation[4].

1.2 Overview of Relevant Foreign Studies

Theoretical and practical approaches to industry-education integration have been more methodically discussed in foreign studies. For instance, businesses and schools collaborate on personnel training under Germany's "dual system" vocational education model, achieving a close integration of theory and practice. The development of talents with practical ability and vocational literacy is significantly impacted by this model. To encourage the positive cycle of scientific and technological innovation and talent training, some colleges and universities in the US have also formed close cooperative relationships with businesses to work together on research and development projects and talent training programs. The application of industry-education integration in higher education is the primary focus of domestic research. Higher education has had to adapt and innovate its talent training model in response to China's industrial structure upgrading and transformation in recent years. To develop more highly skilled workers who can satisfy the demands of the market, a number of academics have started to investigate how to incorporate the idea of industry-education integration into higher education. Certain studies also attempt to develop a talent cultivation model for product design specializations that is predicated on the union of industry and academia. To improve students' employability and practical skills, for instance, some academics have proposed the concept of creating a "course and post docking" curriculum system. This would clarify the path of employment and strategically arrange the teaching methodology and subject matter[5].

2. Relevant Theories

2.1 Theory of Industry-Education Integration

The promotion of the integration and development of talent training, scientific research, social services, and other aspects is at the core of industry-education integration, a key idea in today's comprehensive cooperation between vocational education and industry. In order to achieve the coordination and advancement of education and industry, this theory highlights the reciprocal relationship between industry and education and promotes resource sharing and complementary benefits. Various modes emerge as a result of the integration of education and industry, including order cultivation, work-learning alternation, school-enterprise cooperation, etc. These approaches to applying the field of education have greatly enhanced students' practical aptitude, spirit of innovation, and professionalism [6].

The theory of industry-teaching integration provides strong theoretical support and practical guidance for the reform of the cultivation mode of top talents in product design. It is expected to create a top-notch product design professional talent cultivation mode through in-depth research and hands-on exploration, which is more in line with market demand and the law of industrial development, and to positively contribute to the cultivation of top-notch product design talents.

2.2 Theory of Cultivating Top Talents

The cultivation process of top-notch talents, as high-quality talents with outstanding talent, innovative thinking and leadership ability, integrates the concepts of personalized, innovative and practical education. Individualized education focuses on discovering the unique potential and strengths of each student, and tailoring the development path for them so as to maximize their individual strengths. Innovative education encourages students to challenge convention and explore the unknown, fostering their sense of innovation and creativity. The goal of practical education is to help students become more adept at applying their theoretical knowledge to real-world scenarios by strengthening their problem-solving and practical skills.

In the process of cultivating top talents, personalized education, innovative education and practical education complement each other and constitute the core framework of the cultivation system. Personalized education provides top talents with a precise development direction, innovative education injects them with continuous innovative power, and practical education ensures that they can transform innovative ideas into practical results. Combining these three naturally fosters the growth of exceptional talent overall as well as the development of additional exceptional talent with a spirit of innovation and practical ability for society.

3. A Shift in the Way Top Talent is Developed Based on the Idea of Industry-Teaching Integration

3.1 Constructing a Multi-Dimensional Industry-Teaching Integration Course System

Several factors must be carefully taken into account when optimizing the curriculum system for students majoring in product design in order to guarantee that the course material is thorough, futuristic, and useful. First of all, the basic theory course is the cornerstone for building the knowledge system of product design students. Through the systematic study of design principles, aesthetic foundation, human-computer interaction and other theoretical knowledge, students can establish a solid design foundation, laying a solid foundation for subsequent professional development; design thinking courses are the key link in cultivating students' innovation ability. Such courses should focus on cultivating students' problem finding and solving ability, critical thinking and creative thinking. Through the introduction of design thinking methodology, combined with case study and practical operation, students are guided to learn how to start from the user's point of view, dig into the needs, and put forward innovative design solutions; furthermore, design methodology courses should focus on teaching students specific design skills and tools. With the continuous development of technology, many new design methods and tools have emerged in the field of product design, such as 3D modeling and virtual reality. To guarantee that students acquire the most up-to-date design skills, the curriculum should update the teaching materials on a regular basis and follow the industry's development trends. Design practice courses are a crucial tool for improving students' practical skills and sense of teamwork. Students can improve their ability to solve practical problems and hone their skills in a real design environment by participating in school-enterprise cooperation, project-driven learning, and other practical teaching modes. Meanwhile, the practical courses can also help students establish a close connection with the industry and build a bridge for future career development.

In addition to the above four aspects of the curriculum, the introduction of interdisciplinary courses should also be emphasized. As a highly comprehensive discipline, product design is closely related to many fields. By offering interdisciplinary courses on topics like the fusion of technology and art, design and business innovation, etc., students can develop a variety of skills, widen their perspectives, and think creatively.

3.2 Constructing the Practical Teaching System with the Cultivation of Innovation Ability

The establishment of on- and off-campus training bases is one of the important means to

strengthen practical teaching. Schools can work with businesses in the industry to set up training centers for product design, giving students access to real-world work environments and opportunities for practice. In the practical training base, students can come into contact with the latest product design concepts and technologies, and participate in actual product design projects, so as to continuously hone their design skills and problem-solving abilities in practice. At the same time, the training base can also provide students with the opportunity to communicate with industry experts face to face, which helps students broaden their horizons and enhance their professionalism.

Carrying out school-enterprise cooperation programs is also an effective way to enhance the effectiveness of practical teaching. Schools can actively seek cooperation with enterprises to jointly carry out product design and development projects. Students can engage in the entire product design, development, and promotion process under the supervision of teachers through school-enterprise cooperation projects. They can also obtain a thorough understanding of the real process of product design and market demand. This project-driven practical teaching mode can not only enhance students' practical ability and teamwork ability, but also cultivate students' market awareness and innovative spirit.

Encouraging students to take part in design competitions is another important way to encourage their innovative spirit and practical enthusiasm. Schools can regularly organize or participate in various product design competitions to encourage students to actively participate and achieve good results. Design competitions usually require students to carry out innovative design for a specific problem, which can not only test the design level and innovation ability of students, but also exercise their problem solving ability and rapid response ability. At the same time, through the exchange and display of the competition, students can also learn from the strengths and experiences of others, and constantly improve their own design level and comprehensive quality.

3.3 Build a Platform for Industry-Teaching Integration with Resource Integration

Creating a platform that integrates industry and education is a crucial step toward reforming the way that elite talent in product design is developed. The platform's construction can facilitate the sharing of resources and advantages between educational institutions and businesses, while also offering robust support for the development of talented product designers who meet market demands.

Resource integration is a crucial component in the building of the industry-teaching integration platform. Schools and businesses should take full advantage of their respective advantages, combine their educational, technical, and market resources, and work together to build a comprehensive platform that combines social service, scientific research, talent development, and technological innovation. This can offer a consistent flow of talent support and technical assistance for the growth of enterprises, in addition to enhancing the quality of instruction and the scientific research capabilities of the institution.

The creation of R&D centers, collaborative laboratories, training bases, and other venues for school-business collaboration can help to foster the integration of industry and education. An R&D center for school-business cooperation can combine the resources of both parties and work together to conduct cutting-edge technology research and innovation in the field of product design; joint laboratories can provide students with a more close to the actual working environment and practice opportunities, and help them better master the core skills of product design; practical training base can provide students with a real professional environment, so that they can continuously improve their professionalism and comprehensive ability in practice. and comprehensive ability.

By holding industry-teaching integration forums and implementing school-enterprise cooperation projects, the industry-teaching integration platform's influence and field of cooperation can be further increased. The Forum on Industry-Education Integration can serve as a forum for thought-provoking dialogue and experience sharing between educational institutions and businesses. It can also foster deeper collaboration between the two parties in areas such as talent development and scientific research. The school-enterprise cooperation projects can carry out targeted

cooperation in response to specific problems and needs, and realize the sharing of resources and the complementation of each other's advantages.

3.4 Teacher Construction

In the context of the integration of industry and education, the construction of teachers has become a key part of the reform of the cultivation mode of top talents in product design. Strengthening the development of "dual-teacher" faculty is essential to raising educational standards and developing top talent in accordance with market demand.

Professionals with extensive industry experience and practical knowledge can be introduced to schools through a variety of means. These talents may come from enterprises, design companies or scientific research institutions, they have accumulated valuable experience in practical work, and have a deep understanding of industry dynamics and market demand. Bringing in these talents will not only enhance the practical ability of the faculty, but also bring the school closer ties with the industry.

Systematic training and improvement of existing teachers is also essential. Schools can regularly organize teachers to attend professional training courses, academic seminars or field trips to enterprises to broaden their horizons and update their knowledge structure. In addition, establishing a system for teachers to go to enterprises for job training is also an effective way. Through actual work in enterprises, teachers can gain a deeper understanding of the process of product design and market demand, thus enhancing their practical teaching ability and industry awareness.

In addition to the above measures, inviting industry experts to give lectures in schools is also an important way to strengthen the construction of the faculty. Industry experts have profound industry background and rich practical experience, and their lectures can often provide students with more practical cases and cutting-edge industry information. Students can gain a deeper understanding of the most recent advancements and trends in the field of product design through interactive discussions with experts.

4. Based on the Integration of Industry and Education, Product Design Specialization Teaching Reform Practices

The Guilin University of Electronic Science and Technology's product design specialty has worked closely with businesses to investigate the cultivation mode of industry-teaching integration in order to support the development of elite talent. The primary actions taken thus far are as follows:

4.1 Establishment of Joint Laboratory

Guilin University of Electronic Science and Technology Product Design Program and Guilin Zhongyihongda Technology Co., Ltd. jointly established "GuiDian-Zhongyihongda Yuan Universe Driving Training Joint Laboratory", which mainly focuses on the application of cutting-edge technologies in the fields of virtual reality, digital twin and other areas in the study of automobile driver training, and mainly carries out the development of new products and technology platforms and talent cultivation of related technologies. Talent training in related technologies. With the enterprise demand as the guidance, the joint laboratory as the core, the "dual-capable" teachers take the lead, forming a closed-loop structure among universities, enterprises and students.

4.2 Joint Curriculum Development

Combined with the smart learning car project of the enterprise, the relevant functions and technologies of the project are disassembled and applied in classroom teaching, as shown in Figure 1, the learning car scene design and UI interface design produced by the course.



Figure 1: Learning to drive interface design for course products



Figure 4: Newly developed product UI interface

4.3 Development of the Project in Conjunction with the Curriculum

Combined with the project, the enterprise project is introduced into the subject, product design and development, after more than five years of cooperation, the project has made good progress, as shown in Figure 3 is a new generation of products designed by the project development, as shown in Figure 3 and Figure 4.

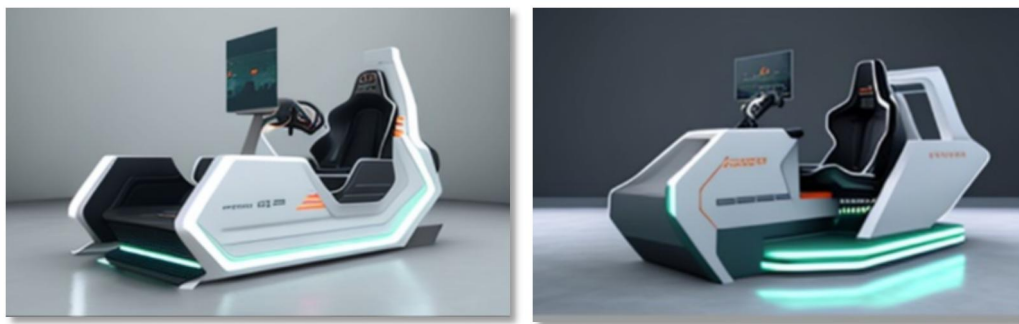


Figure 3: Newly designed product styling

After five years of practice, Guilin University of Electronic Science and Technology and Guilin Zhongyi Hongda Co., Ltd. have established a relatively solid cooperative relationship, and at the same time formed a benign teaching mode of industry-teaching integration. On the one hand, with the help of the school, the enterprise's smart learning car program has achieved good results, the test pass rate than the traditional driver training mode has increased significantly; on the other hand, through the enterprise project into the classroom, students can contact the actual project, which enhances the students' motivation to learn.

5. Conclusion

In the context of the integration of industry and education, we have gradually constructed a special product design professional top-notch talent training mode. First and foremost, the reform of

the top talent cultivation mode revolves around the optimization of the curriculum system. Through the introduction of cutting-edge courses in the industry, the opening of interdisciplinary courses and the strengthening of practical courses, the curriculum system of the product design specialty has become more complete, and has realized a close docking with the development of the industry; Furthermore, the building of the platform of the integration of industry and education offers a strong support for the cooperation between schools and enterprises and the work-university alternation. Second, the strengthening of practical teaching effectively enhances the students' practical ability and innovative spirit, resulting in a significant improvement in the students' practical ability. The creation of a joint laboratory, research and development center, and other platforms has allowed schools and businesses to collaborate more closely, fully realizing the benefits of resource sharing and complementary advantages; Lastly, the faculty of the product design specialization has been greatly enhanced by the addition of experts with extensive backgrounds in the industry and practical experience, as well as by enhancing the training and development of the current teachers. The development of exceptional talent is strongly ensured by this elite faculty.

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