

# Research on the Talent Training Mode of Industrial Design Majors Under the Background of Interdisciplinary

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**Abstract.** With the transformation of China's manufacturing industry from "Made in China" to "Intelligent manufacturing in China", more and more industrial enterprises value the importance of industrial design. Manufacturing also needs industrial design to increase the added value of its products urgently. This paper collates and analyzes the definition of the new mission of industrial design majors in colleges and universities, and further analyzes and reflects on the training mode and curriculum construction system that integrates with regional economy. Under the current development status of artificial intelligence, big data, human-computer interaction technology, virtual reality and the background of new engineering, combined with the requirements of the training of application-oriented talents, the paper puts forward the construction of the curriculum system of industrial design majors and elaborates how to construct the interdisciplinary teaching system of the integration of science and technology and art in actual teaching. It also illustrates the goal and new mission of professional training through the comparative analysis of student's ability training data.

**Keywords:** new engineering, industrial design, new commission, curriculum system, interdisciplinary

## 1 Introduction

With the advent of the era of "Intelligent Manufacturing in China", companies are transforming from OEM (Original Equipment Manufacturer) to ODM (Original manufacturer Design and Manufacturing), OBM (Own Branding & Manufacturing), and industrial design will gradually be upgraded from the original product appearance design to high-level product system design aspects such as innovative application of manufacturing technology, product image planning, and user-centered design<sup>[1]</sup>. Enterprises began to pay attention to product planning, analysis, innovation, structure concept design as the basic content of product research and development. China's industrial design has gone through decades, the demand for talents in industrial design has undergone tremendous changes, and outstanding industrial design talents have become more and more key factors to promote industrial development and transformation.

## 2 The new mission of industrial design under background of new engineering

Industrial design is an interdisciplinary subject that combines artistic innovation and engineering. It mainly focuses on basic theories and skills of industrial product art design and the engineering technology foundation of industrial product structure and function design. In simple and plain terms, design means solving problems or innovating to improve the quality of life for people. Product design is a way of thinking, a business thinking model that allows people to live better, and an innovative thinking model that allows problems to be solved.

When hearing the term "industrial design" for the first time, most people always associate it with machinery and parts. However, the real industrial design is closely related to the daily life of each of us.

(1) Improve our daily habits through design and make life more convenient.

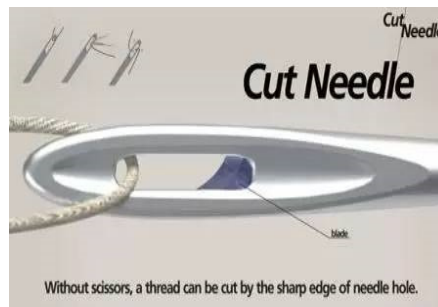
Although we have become accustomed to the product of pencils with erasers, pencils and erasers were completely independent in the past. After this product was invented in 1858, such small changes have achieved great success both in terms of social significance and economic benefits. As shown in (Fig. 1) below. This product cleverly combines two commonly used features and becomes a hot spot. Its practicality is self-evident<sup>[2]</sup>.



**Fig. 1.** A pencil with a rubber gap

(2) Industrial design can bring real convenience to life. As shown in (Fig. 2) below.

Threading is a troublesome and delicate job when Chinese needles have only round holes. So much so that when Japanese embroidery needle appeared in the oval hole, it monopolized the Chinese embroidery needle market for a long time<sup>[2]</sup>. The new product design, based on the oval pinhole, adds a small blade design, which simplifies the stitching steps.



**Fig. 2.** Sewing needle

(3) An important aspect of industrial design is to pay full attention to human-computer interaction. As shown in (Fig. 3) below.

The very common tweetable kettle, which dated back to 1985, was designed by design guru Michael Graves. The work originated during the Pop Movement, and its classic is to install a small whistle at the position of the spout, which naturally starts to chirp when the water boils, drawing attention of the user. Never worry about boiling water again. Innovation is not only the form of innovation, the combination of function and form, but also an interpretation of product design. The human-machine scissors design improves the pain of long-term use of scissors.



**Fig. 3.** scissors

(4) The charm of industrial design is to enhance the added value of products. As shown in (Fig. 4) below.

From Coca-Cola's delicate and soft bottle shape to the logo of President Kennedy's plane to the familiar greyhound bus, unlimited imagination and superior design inject a living element into the development of industry, which is the mission of industrial design<sup>[3]</sup>. With the diversification of market demand, industrial design is not as big and out of reach as imagined, and most of the fields it involves are visible to the naked eye. Products that can meet people's physical and psychological needs, no matter how small the market they have, will also add a strong historical flavor to industrial design.



**Fig. 4.** The Coca-Cola logo

### **3 The professional field and ability requirements of the combination of industrial design and regional economy**

Industrial design covers a wide range of aspects of social life. University industrial design majors around the regional industry and social development of the needs of design talent, based on regional characteristics, such as: materials, industry, tourism, etc. while around the advantages of regional characteristics of natural resources, the university curriculum should cover creative products, manual, semi-mechanical processing completed experimental, personal, customized design of small-volume products. Through practical teaching and application of innovation training, priority is given to the needs of regional industry development. Graduates are mainly for enterprises and institutions, professional design companies and Internet innovative enterprises, engaged in product innovation design, user survey and research, corporate image planning, product marketing, enterprise management and other related work. Industrial design should focus on training applied and innovative talents with good professional and technical ability, ideological and moral quality, cultural literacy and service to the local area.

Students in this major need to have a solid foundation in natural sciences and a better foundation in the humanities, arts and social sciences. Some basic knowledge areas involved in product design include industrial design engineering foundation, design performance foundation, design theory, modeling design foundation, engineering materials, ergonomics, design materials and processing, computer-aided design, market economy and enterprise management. After systematic study, students in this major need to have initial ability of research and development of new products, strong experimental skills, hands-on ability, and artistic appreciation and creative ability<sup>[4]</sup>.

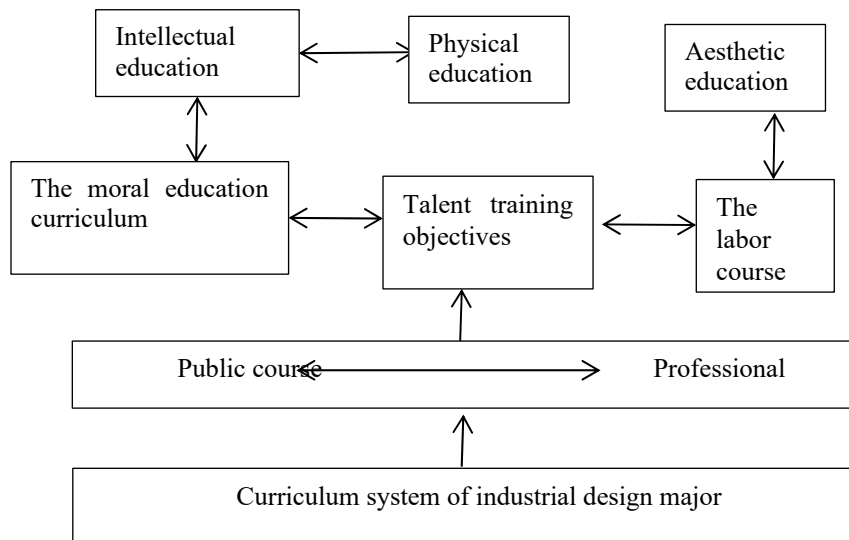
### **4 Ideas, ways and methods of building curriculum system of industrial design majors**

#### **4.1 The idea of constructing the professional curriculum system**

In constructing the professional curriculum system of industrial design, based on the basic concept of vocational education to train students' ability, more focus should be paid to the ideological and political quality and moral development of students, and construct a profes-

sional curriculum system that conforms to the law of education and the law of students' growth and embodies the characteristics of the times. The following (Table 1) shows the professional curriculum building for industrial design majors

**Table 1. Professional curriculum building**



#### 4.2 The way and method of constructing the curriculum system of industrial design majors

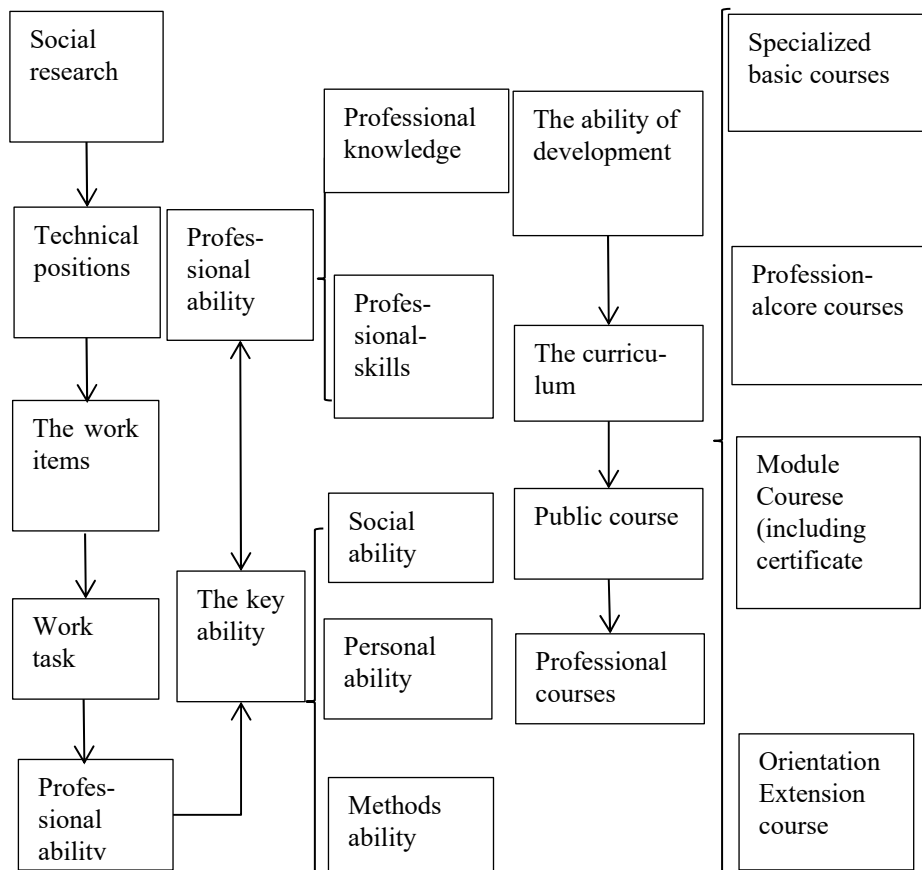
According to the career development plan of industrial design students, with the goal of cultivating high-quality and high-skilled personnel, adhere to moral education as the first, carry out the construction of professional curriculum system, curriculum is set up according to the logical relationship of "professional basic ability and quality training professional core ability and quality training post comprehensive ability and quality training". Based on the development idea of the work process from the vocational post to the course content, follow the principle of "occupation, system and openness" and construct the combination of engineering and talent training model with professional ability as the body, "school-enterprise co-education and two-track system"<sup>[5]</sup>. The following (Table 2) shows the curriculum Build Pathway Grade Comparison.

**Table 2. Curriculum Build Pathway Grade Comparison**

Grade	Professional core competencies	Professional position ability	Comprehensive quality ability
Freshman	20%	20%	60%
Sophomore	40%	30%	30%
Junior	40%	40%	20%
<b>Student employment rate (Average)/%</b>	95%		

In line with the "strengthening technical skills training, high-level industry indicators", industrial design professional based on pillar industries and regional economic development, training for local economic services product design, planning, user research, interface design and other high-quality high-skilled personnel. Consistent with the core competence of professional job group (field of practice) set up professional core courses, in keeping with professional group development planning, set up basic platform courses, around the employment needs of professional core courses, in compliance with the key development direction of students to set up product design direction modular professional elective courses, according to individual development and overall quality requirements set up graduation internship, graduation design, in agreement with students' interests and special needs to set up professional expansion courses. The following (Table 3) shows the course construction path for industrial design majors.

**Table 3.** Course build path



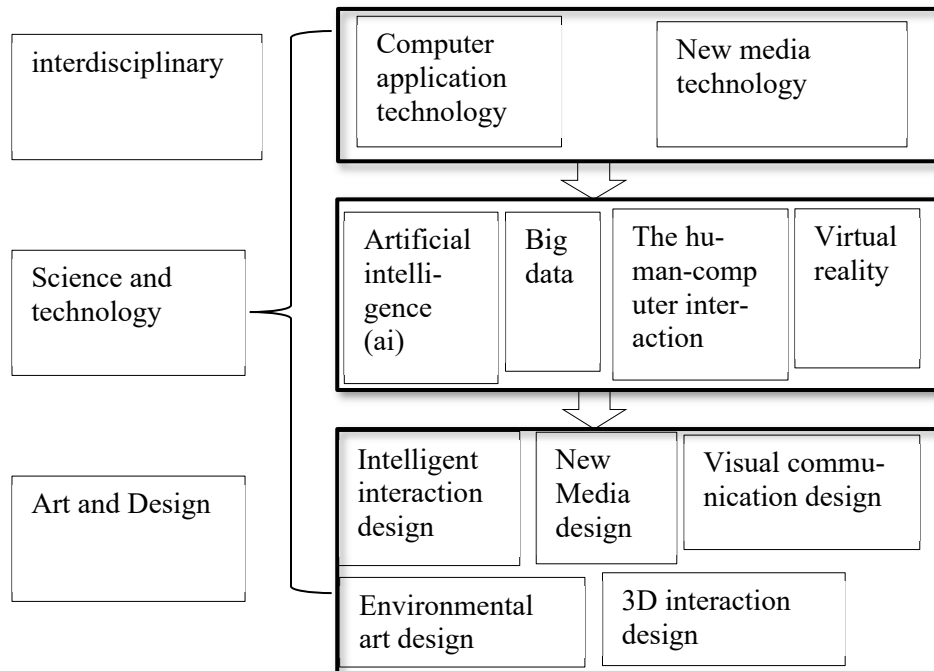
Through optimization of the course system of industrial design majors, the implementation of curriculum project and task, design standard vocational qualification certificate access channels, students' professional skills docking international professional standards can be found. At

the same time, a channel has been opened for students of this major to participate in national and provincial skill competitions.

## 5 Professional construction of interdisciplinary, cross-integration, sharing experimental platform

Industrial design is a multidisciplinary cross-cutting and comprehensive professional, in order to achieve interdisciplinary integration and development, better use of teaching resources, improve teaching practice ability and students' professional creative ability, the creation of multidisciplinary integration of the shared experimental platform is essential. Consistent with the foundation of the school's professional group construction, combined with the local regional economy and the operation of the school teaching and scientific research projects, the laboratory of industrial design specialty becomes a shared space, and promotes cooperation and sharing of resources among various professions in-house. The laboratory will be turned into a multidisciplinary and integrated experimental site, laying the foundation for better incubation of teaching and scientific research results, thereby improving the ability to integrate interdisciplinary resources.(Table 4)below shows that the industrial design major is a major that combines technology and art, which requires science and technology to be integrated into art and design.

Table 4. Cross-discipline



## **6 Conclusion**

Through the exploration and practice of the new mission of industrial design majors under the background of new engineering, it is found that students' ability to develop and apply product design has been significantly improved. In addition, the interdisciplinary integration of the curriculum system and the new era, the new mission of the reform of the training objectives greatly stimulate the creative thinking of students. It also improves the ability of students to explore and learn about the various possibilities of realizing the program. In colleges and universities, the combination of technology and art, through professional learning, the formation of systematic aesthetic knowledge, so that students have a certain degree of product design capabilities. Aiming at the characteristics of industrial design majors, students are trained to have strong product design skills and hands-on skills. Through study of technology and art combined courses, college students can master systematic aesthetic knowledge with a certain degree of product design ability. In view of the characteristics of industrial design majors, schools can train students with relatively strong product design skills and hands-on skills. At the same time, student employment should also take into account the needs of small enterprises and small and medium-sized cities and towns. It is essential to cultivate students to use aesthetic knowledge they have learned to combine with computer design software, to establish quality and economic concepts, to understand the new materials, new technologies, new processes and their development related to product molding, and to cultivate students' vision of fashion aesthetics and avant-garde market product development, so as to improve the quality of life of the whole nation.

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### **Article Supporting Project**

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2. Yibin Vocational and Technical College Science and Technology Innovation Team Project "Cultural Tourism Product Science and Technology Innovation Team" Project ID: ybzy21cxt-d-05
3. Yibin Vocational and Technical College Teaching, Research and Teaching Reform Project "Research on Teaching Methods of Regional Cultural and Creative Product Courses Driven by Industry-University-Research Collaboration", project number: 21JGZD-09



4.Yibin Vocational and Technical College Teaching, Research and Teaching Reform Project  
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