

# Exploration on Talent Cultivation Pattern of Industrial Design through perspective of Cross-border Thinking

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**Abstract.** This article discusses the study of integrating cross-border thinking into talent cultivating pattern of industrial design, which breaks the traditional talent cultivation pattern system of industrial design and carries out a research from the following three aspects: making training plans, creating cross curricular group among college and department associations, building a cross-border team of teachers. By this way, it can achieve interdisciplinary teaching and practical guidance, and construct the mode of talent cultivating with "cross-border" philosophy as the main body. The colleges, who carry on the reform of teaching pattern of industrial design with a cross-border way, expand the innovation vision of teachers and students, meet the demand for personnel in the employment market, improve the innovation ability of university students, and increase the employment rate of graduates and employer satisfaction level.

## 1 Introduction

At present, many domestic universities have established industrial design majors. According to incomplete statistics, there are more than 1000 colleges offering industrial design related majors in China, even some colleges establish independent school of art and design. Industrial design is an integrated course that combines aesthetics, humanities, engineering technology, history, etc, and it is closely related to human life, culture, science and economy. But some industrial design related majors in China are derived from art majors, and some are derived from the mechanical design majors, so many of their teaching models are using the ones from art or engineering majors, neglecting the relationship between talent cultivation of university and the development of market, society and science and technology, causing the knowledge learned in the 'ivory tower' unable to solve the problems encountered outside of it, leading to students who graduated from industrial design majors cannot meet the requirements of the global labor market, so that the college students would not be hired just after graduation. Due to this fact, it is urgent to change the traditional training mode of industrial design. The aim of talent cultivation for industrial design needs to serve the national development strategy and industrial demand. Benefit from the development of new technologies such as Internet, Intelligence, 3D printing and online teaching, cross-disciplinary teaching integrating business, science and technology, art and other multi-specialties is the hot topic and prevailing trend of industrial design education in the 21st century.

## 2 Cross-border

The original meaning of cross-border is "transition and transformation". In education field, cross-border means to cross field, cross discipline, cross teaching professionals, cross academic team and cross organization, in order to cultivate practical talents of industry counterparts and industry requirements for the market competitions. Francis Johansson, an American innovator, said: it often gets the effect of  $1+1>2$ , when thoughts and ideas from different fields are intertwined, collided and merged[1]. Cross border is not only a behavior, but also an innovative way of thinking. Therefore, we should integrate cross-border thinking and design education, change the traditional talent training style, break the boundaries and constraints of the existing disciplines and specialties, establish a collaborative training mode of school enterprise cooperation, and train students in a joint way of cross disciplines and cross specialties, so as to form a set of talent training model meeting the market demand which guided by the industrial practice. It is a trend for the reform of industrial design education to apply cross-border thinking to the education of today's universities, break the restrictions on the division of various specialties in universities, integrate the resources of teachers in various specialties, form student teams, make rational use of teaching sites and equipment, and focus on the ability of innovation and entrepreneurship of college students. Design specialty has the characteristics of diversity and complexity. It is a subject integrating science, technology, engineering, management, business marketing, marketing and other fields. So industrial design is a cross domain characteristic that provides unique conditions for its

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cross-border practice. Therefore, it is particularly important to learn the relevant knowledge of other subjects through interdisciplinary teaching mode, and cultivate design talents with scientific spirit, humanistic quality and practical ability to meet the demands of modern society[2].

### **3 Exploration of Teaching Model Based on Combination of cross-border thinking and talent cultivation**

In recent years, the talent cultivation model of industrial design mainly includes industry-university-research cooperation, school enterprise cooperation, studio system, Contract mechanism, etc. in China. But an excellent design team needs diversified professionals to work together with the complexity and wide range of current design contents. Therefore, design education has begun to become integrated subject education of technology, engineering and business economy. The idea and technology of other related subjects can make more accurate and suitable design work. As said in Chinese idiom that stones from other mountains can be used to attack jade. How to use their own local resources to carry out cross-border education has become a hot spot of art education reform in colleges. In this article, the mode of cross-border talent cultivation is mainly studied in the following three aspects.

#### **3.1 Making training plan of interdisciplinary and cross-academic for Undergraduates**

At present, the training mode of industrial design still applies to the thinking of traditional arts and crafts design which the industrial design can be roughly divided into product, animation, top surface, environmental art, display and other directions in China. Although the division of discipline system is complete with the development of society and the progress of technology, the discipline setting of industrial design in colleges cannot meet the new demands of current market. At the same time, the professional course schedules and teaching contents of colleges have little distinction, lack of its own school-running characteristics. As a result, students have no competitive strength when they first enter the society. Therefore, talent cultivation mode needs reform. The reform has no unified scale and standard, it requires innovation and reform based on local conditions, differences and regional characteristics. Therefore, it is necessary to establish an cross-disciplinary and cross-field training mode and it becomes the breach of the development of industrial design education. The training plan of cross-border education shall be analysed in detail from the multi-angles of specialties setting and teaching objectives, curriculum construction, etc. First, we shall established a general specialty unlike the previous subdivision of professional content. As the division of subjects is too detailed, it will lead to the separation of knowledge and life, the disconnection among different subjects, which is not

conducive to the cultivation of students' innovation thoughting. For example, art and design education of Japanese is first carrying out for two years in the Department of Education study after enrolment, regardless of major, and students will train in teams at first before learning professional courses. Design educators of America suggest that students should not be proficient in one subject too early, but should be widely involved in many subjects, so as to have a broad career choice[3]. Therefore, the teaching goal of cross-border talent cultivation for industrial design should train the art design talents with T-type knowledge structure and national cultural heritage together with multiple international perspectives, who know the new trend of current international design development well, who carry out design cooperation and communication across regions and cultures, and who become multi-discipline interdisciplinary talents with innovative consciousness and innovative abilities. The course structure of the training plan adopts the segmented credit "2+2 system", that is to say, there is no need to learn too many professional courses in the first two years of university, but to set up a series of interdisciplinary learning platforms. Students are allowed to explore the interdisciplinary field freely under the guidance of tutors from different majors. Each tutor is responsible for guiding several undergraduates through "tutorial system", the number of students should not be too large. and stress on training students' independent learning ability and innovative thinking, expand students' vision, understand the knowledge fields of different disciplines, to better promote students' personalized development [4]. Students choose courses of different majors and disciplines according to their own development needs and interests from the third year of study, and manage students through credit system. No matter what course the students choose, they can graduate with required credits.

#### **3.2 Create a cross course group based on cross College and interdisciplinary**

Foreign countries start relatively early in this area, for example, in Oxford University in the UK, more than 30% of the courses are designed by the combination of two disciplines, such as philosophy, mathematics and engineering science. In recent years, some famous universities in China have also begun to build brand specialties according to their own advantages, such as the Academy of Fine Arts of Tsinghua University have established a lifelong learning laboratory in 2016, which is an international, interdisciplinary and cross-border innovative learning education and research institution. Zhejiang University takes advantage of its computer technology, integrating industrial design with computer technology, taking new technology as core, integrating embedded system with mechatronics and industrial design, setting up the training goal of combining industrial design and engineering technology[5]. Therefore, the setting of cross curriculums shall be combined with the characteristics of their own

colleges and take full advantage of their research resources and intellectual resources.

In general, the courses of freshmen and sophomores are basically focused on basic theory and research methods. The purpose of these courses are to cultivate students' ability to analyze and solve problems and to guide students to stimulate their interest in autonomous learning. The basic content of the course is to allow the student to master research methods, reasonably and effectively utilize the research tools to express creative ideas. Teaching methods and approaches mainly focus on seminar teaching. For example, teachers and students discuss together on how to set up and plan correct research objectives and the research scope, how to do group cooperation study, and how to conduct quantitative and qualitative analysis through the search and utilization of academic resources inside and outside the university. In the past two years, teachers guide students to form their own research interests, increase some practical links, help students understand and master the basic theoretical knowledge and basic research methods, and can be flexibly applied in design practice through the interdisciplinary platform. There should be fewer

required subjects in the teaching and training plan, and a large number of elective courses shall be provided during the first two years of college. Students shall be encouraged to choose courses independently according to their own interests, hobbies and future development direction. In the third year of the university, the core courses of interdisciplinary creative practice is set up and focuses on cultivating students' independent creative practice ability from theory to practice, such as product design plus cloud computing and the Internet, industrial product display plus digital media technology, product design + biomedicine, performing arts and so on[6]. This creative practical course pays more attention to the ability of students to complete projects independently. At the same time, teachers from different specialty can set up relevant elective courses

according to their own research fields, which will help students understand design from multiple dimensions, and inspire innovative design inspiration and thinking. In the graduation design of the senior year, it mainly consists of lectures, tutorial courses and project design, as shown in Figure 1.

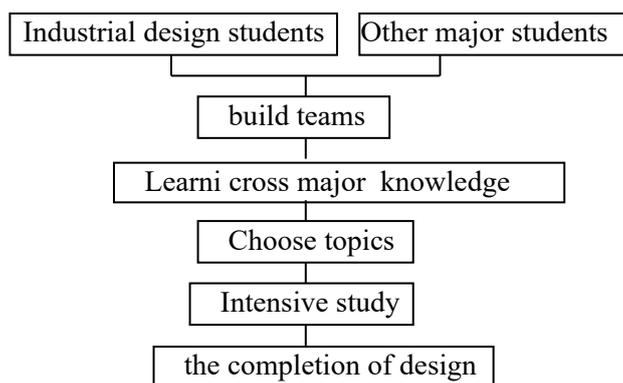


Figure 1. The flowchart of the graduation project

At this stage, we need to consider industrial design on how to establish a cooperation mechanism with other disciplines to make teachers of different majors interact with each other, to promote the feasibility and authenticity of graduation project[7]. For example, the Imperial Palace has launched the cultural and creative design project of "Lipstick series", as shown in Figure 2, cross border integration of traditional culture, product design, cosmetics, tourism and internet design so that the color cosmetics of Imperial Palace popular from all walks of life. Most of the graduation projects contents are from the actual projects of enterprises or social hot spot. For example, as novel coronavirus has spread all over the world at present, students could choose some epidemic

daily protection products as graduation project contents. For example, ultraviolet disinfection detector. Meanwhile, the instructor is not on one's own, but a team composed of experts outside the college, first line designers from the enterprise and teachers from different specialties. The students of each research group are also mixed from different departments. The interdisciplinary cross integration of different fields and specialties, not only conducive to the understanding of professional interaction and expand students' knowledge vision, but also makes deeper design topics and inspires students for their full cooperation and comes into being the good design thinking[8].



Figure 2. Lipstick of Imperial Palace

### 3.3 Realizing interdisciplinary teaching and practical guidance, building a cross-border combination of teacher's team

Using the resources of colleges and universities, we will set up interdisciplinary and cross-college teaching and research teams to provide comprehensive technical foundation support and services for students' learning and research, and break the traditional training model system. The development of interdisciplinary teaching in industrial design education needs to consider the construction of teachers' team. The single-specialty teachers do not meet the needs of the development of modern education, and can not complete the teaching task of industrial design[9]. So we need a variety of teachers with different subjects and professional backgrounds. Teachers with diversified specialty backgrounds are the basis for building interdisciplinary courses because many research projects need teachers' guidance from different professionals. Industrial design break the discipline boundaries and constraints in terms of the proportion of teachers. There are not only design teachers, but also teachers from different specialty backgrounds, such as film, philosophy, music, psychology, law, biological gene, etc. Such a team of teachers breaks the boundaries of disciplines. It is conducive to the introduction of professional research thinking and method into the project research of industrial design, and it broadens the connotation and method of design. Interdisciplinary teaching not only need full-time teachers, but also need a designer, business leader, artists and so on[10]. Integrating the design views of different fields can improve students' cognitive and practical abilities which allow students to understand the actual operation process of real projects in colleges. Students truly get the experience on how to apply what they have learned in classroom to actual enterprise production.

## 4 Conclusion

Applying cross-border thinking into industrial design makes it possible to provide a comprehensive technical basis and services to acquire multi-specialties knowledge to solve the professional problems and to improve the comprehensive quality and ability to college students through the formation of interdisciplinary, cross-college teaching and scientific research team. Boldly innovate and subvert the traditional teaching model to

better adapt to the demands of 21<sup>st</sup> century economy market for professionals. Cultivate the industrial design talents that the society urgently needs, greatly expand the employment scope of college industrial design students, and improve the employment rate of graduates.

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