

# Research on the Reform of Practical Teaching System of Product Design Major

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## ABSTRACT

China is in the period of rapid development of industrialization, and the demand for professional talents in product design is increasing. As the higher education of cultivating talents, how to cultivate design talents who can adapt to the social development and have the ability of design practice is an issue faced in the reform of professional curriculum. Therefore, the design majors of various colleges and universities try to constantly adjust and reform the curriculum. Taking the product design major of Sias University, which belongs to the category of Sino-foreign cooperative education, as an example, this paper carries out the reform and research on the practical teaching system of product design major, and studies how to build a comprehensive practical teaching system, and how to deepen the practical course classroom to cultivate applied talents who are close to the market demand of product design professionals.

*Keywords: product design, practice teaching, teaching reform*

## I. INTRODUCTION

As an interdisciplinary subject in the field of design, product design is not only a subject that studies art, but also one that pays attention to production and technology and closely connects with the market. A review of the product design and development experience in developed countries and regions abroad shows that good design education requires close contact with practice. At present, the practical teaching curriculum system used pays more attention to theoretical teaching and conceptual design to some extent. The requirements of students to complete the project in the course mostly stay in the stage of some design sketches. Since many projects in courses are virtual ones, many designs cannot be out into the link of practice, lacking practical meaning.

## II. CURRENT SITUATION AND PROBLEMS OF PRACTICE TEACHING OF THE PRODUCT DESIGN MAJOR

First of all, it is the lack of practical design projects. In the process of practical teaching, a lot of training projects of design course come from some virtual subjects set by teachers. And in terms of program modification and optimization, teachers give their guidance from the perspective of academic experience in many cases. In some purely commercial projects,

teachers still lack certain experience. In order to let students truly understand the design needs of enterprises during their study in school, and make them quickly understand their own shortcomings and what they need to learn and practice, it is necessary to let them participate in actual projects.

Secondly, the practice teaching space is limited. At present, the design colleges and universities all over the country basically have professional laboratories and studios, but there are some problems in the operation and teaching in these laboratories and studios. There are problems in the work cooperation between teachers and laboratory staff, the utilization ratio of teachers and students in the laboratory and the statistics of consumables, etc. As a result, the utilization rate of the laboratory is not high, and the students' practical ability is weak.

Thirdly, school-enterprise cooperation has become a paper talk and a face-saving project. At present, many schools have to deal with various evaluations and assessments from various educational functional departments, so they contact with practical cooperation units to sign various cooperation agreements. However, the results of practical activities of industry-study cooperation in the later stage are always unsatisfactory.

Finally, the system of practice teaching is not perfect. Many schools attach great importance to practical teaching, but the development of practical teaching is only limited to a few practical courses. The effect of practical teaching and the trend of its

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development need to be carried through systematically and reflected in the university curriculum at all times, which requires a complete practice teaching reform system. There should be not only a curriculum practice orientation from the junior grade to the senior grade, but also the practice teaching evaluation system. Only in this way can we check the effect of the reform and improve the quality of teaching.

### **III. AN ATTEMPT TO REFORM THE PRACTICAL TEACHING SYSTEM OF PRODUCT DESIGN MAJOR**

In view of the above problems, the author thinks deeply about the importance and urgency of the reform of practical teaching. In addition to the reform of the teaching organization of the curriculum itself, there is also the reform of the practical teaching system. Only in this way can we comprehensively solve the existing problems, deepen and optimize the practical teaching, and achieve the real purpose of training design talents in line with the actual needs of the society. Combining with the current professional teaching and curriculum system construction of product design major of Sias University, this paper tries to reform from the following aspects.

#### *A. A practical project-oriented teaching method based on school-enterprise cooperation model*

School-enterprise cooperation is one of the emphases in the practical teaching of product design and plays a key role in the process of deepening the reform of practical teaching. It is the long-term significance of school-enterprise cooperation to give full play to its advantages, so that the teaching effect can be reflected, and at the same time enterprises can achieve certain commercial benefits.

In the course of professional practice, efforts should be made to give full play to the advantages of enterprise cooperation and directly enter into the actual project. It is necessary to take the work process as the main line, divide the projects according to the working process, include the whole course content with several projects, and then integrate the knowledge and skills related to the project into the project. Each project is arranged in terms of project analysis, project required knowledge, project required skills, project summary, knowledge and skills evaluation, and thinking questions. For example, in the "Course Design (Research on Folk Culture)" of 2014 product design major of Sias University, the "Erqi District Cultural and Creative Product Design" project of cooperative enterprises was introduced as the main content (Note: the project is provided by Zhengzhou Yingtaogou Arts and Crafts Co., Ltd.)

In combination with relevant theoretical knowledge of the course, the project from the enterprise are given

(or partly given) to the students to complete, and the students are led to conduct research in the enterprise. The project leader of the enterprise directly issues relevant requirements. In the process of the project, the project leader is invited to the classroom to participate in the proposal process and put forward suggestions on modification and optimization. In the final evaluation, experts related to the enterprise and the industry are hired to grade and award the students according to the design specifications and standards of the industry. It should be emphasized that in the very beginning of the design, the "practicability" should be taken into account. The designer must be aware of the production process, and the product design must have economic analysis and consumer market forecast. In the process of participating in the actual project, students should listen to the opinions of party A on the one hand, comply with the production specifications of the manufacturer on the other hand, and have a tutor to grasp the quality of the design at the same time. The guidance from the three sides can ensure the feasibility of the scheme. In this process, the comprehensive training goal of practical teaching can finally be achieved.

#### *B. Establishing the practice teaching mode of "Course Introduced by Project Competition"*

Design competition, as an important criterion for testing teaching results and students' design level, has always attracted the attention of teachers and students. In the previous teaching, when there was a competition, special time was taken out to coach the students. Due to the limited time, the students' participation and the quality of the works were relatively low. In the curriculum reform, design competition projects are introduced into the professional courses. At the beginning of the semester, when the teacher makes the teaching plan, he or she will look for the corresponding design competition according to the different course contents and put the time plan of the competition into the course practice. Through the participation in the competition, on the one hand, the theoretical knowledge can be better applied to practice, so as to strengthen the mastery and consolidation of theoretical knowledge. On the other hand, students' practical ability can be cultivated in designing in a more practical manner. In this course of Product Design I developed by this major, for example, product design principle and method of curriculum, teachers mainly teach the basic concepts and methods and theories of product design in the early stage of the course. At the end of the course, the international design competition of "German Red Dot Award" are introduced. The students are divided into several design groups, and each design group is reasonably combined according to the students' professional expertise, so as to guide the students' sense of teamwork. Then, the time line table of the

competition task is made, and the students are required to complete the corresponding design task according to each time line. Teachers guide students to determine the design needs and innovation points, and students improve their own ability to find problems, analyze problems, solve problems of practical design through the actual design research, analysis and research. Finally, according to the competition process of "Red Dot Award", students complete the design, typesetting (English version), document website uploading, payment for the competition, waiting for review and other links. In the whole process of participation, students have stimulated their interest in learning, and improved their ability of teamwork and practice.

In addition, in the course "Studies of Folk art and Culture" in the spring semester of 2019, the teacher organized students to participate in the competition of two subjects simultaneously: "2019 China · Luoyang (International) Three-color Glazed Pottery Cup", the 7th creative design competition and "2019 Art Creation in China — Changbai Mountain Cultural Tourism Souvenir Creative Design Competition". According to the course tasks, the teacher selected the corresponding high-level design competition and made the corresponding course teaching and guidance plan according to the requirements of the competition. In the course, teachers participate in the whole process from assigning tasks, data collection, actual investigation, analysis and discussion, first draft proposal, scheme optimization, to three-dimensional model, rendering diagram typesetting and object model making, and finally to posting work manuscripts, so as to realize the course objectives. This enables students to quickly gain practical experience in participating in actual discipline competition projects in the short course. At the end of the course, in both the two competitions, there are students who have received outstanding results, certificates of honor and bonuses. It is also a great affirmation for students, which can enhance their personal professional confidence and stimulate their enthusiasm for future professional learning. The teacher also accumulates the experience in the instruction competition process, which benefits themselves as well as students.

### *C. A laboratory workshop that promotes "design" through "production"*

In the current situation of product design teaching practice, it has been concluded that there are more or less problems in the existing workshop system. In the model lab at Sias University, efforts have been made to address such problems. Since "many designs pay so much attention to form that the possibility of production is lacking", students have no way to intuitively feel the material process, modeling, ergonomics and other aspects of the scheme in the process of material production. In the course assignments, the previous

method of determining grades based on renderings was changed, and the method of "considering the design of real objects" was added to the teaching results. Just like the Bauhaus workshop system, where learning is in the process of doing, "production" is considered in improving the "project design". This requires that the functions of the laboratory and workshop should meet the teaching requirements. First of all, there should be a variety of material processing functions, such as modeling deduction used a variety of modeling materials: mud, pottery, wood, metal, plastic, three-dimensional molding process and other processing functions. At the same time, students should be required to learn how to use various processing tools and be familiar with the processing technology of various materials.

The product design major of art and design college of Sias University has a professional teaching laboratory center, which is the Product Model Design and Production Experiment Center. Covering an area of more than 400 square meters, the experiment center owes center experimental equipment and tools including those related to process, material, model processing and production, such as pottery handicraft, 3D rapid printing, two-dimensional carving, wood material processing, metal material processing, oil clay model making and ABS plate model making, etc. The center can not only assist professional courses to carry out practical teaching tasks, but also support the implementation of practical design projects, professional discipline competitions, discipline research projects and other work tasks. Students of all grades of the major can complete different kinds of model making tasks in the laboratory, and students can be allowed to understand the processing technology and forming process of various materials more intuitively and concretely. More importantly, the experimental teaching center adopts the open teaching mode. That means, it is "full-time" open during non-teaching time and teaching time. It is "open-to-all" professionals and related professionals. It is open in "full-range" to both people inside and outside the campus. This model drives the improvement of teachers and students' design, practice and scientific research ability. At the same time, it drives the cross-disciplinary communication, the transformation of scientific research results, the intercommunication and renewal of technology.

In recent years, the product model design and production experiment center has been deepening the open mode. The overall teaching and research strength of the major, especially the practical teaching level, have been gradually improved, highlighting the application-oriented characteristics of talent training. Students have obtained the effective safeguard in the project design each kind of actual verification.

*D. Giving full play to the advantages of Sino-foreign cooperation in running schools and introducing overseas excellent practical teaching resources*

The Sias University is a university jointly run by China and the US, has established cooperative relations with many foreign universities. At the same time, as member of the Association of University Asia and the Pacific, the university also has abundant international resources. Aiming to cultivate the "cross-cultural", "cross-field" and "interdisciplinary" talents, and combining with the advantages of "Chinese-foreign education", the Sias University introduces the abundant international resources into the practical teaching and training of each professional college.

First of all, it is the construction of professional bilingual courses, and the practical communication of foreign language courses, which serve as another advantage of the school in building a practical teaching platform. This university has good resources of foreign teachers, as well as foreign language promotion and teaching for the whole staff, which lays the language foundation for teachers and students in the future study, academic and scientific research exchanges.

Secondly, considering the effect of professional practice teaching, the university puts students in line with international design standards while they are studying. This major guides students to participate in the examination and certification of the professional qualification of International Commercial Graphic Designer (ICAD). In this way, students can use extracurricular time to obtain a valuable international professional qualification while they are studying, which will undoubtedly enable them to have more practical and useful professional certificates when they enter the society.

In addition, in terms of professional practice teaching, relying on the advantages of Sino-foreign cooperation in running schools, the university invites famous foreign designers to the school to carry out the "international master class" practice teaching activities. For example, Mr. Hermann, a famous German industrial design master, was invited to the school to conduct international "master class" design workshop teaching for the product design major. In a short period of time, students can feel the rapid reaction process of international first-class designers and teams from accepting design propositions to discussing research and putting forward problems, coming up with plans, optimizing plans and solving problems, etc., so as to accumulate experience and make full preparations for more international competitions in the next step.

*E. Constructing a complete reform system of practice teaching and improving the evaluation of practice teaching effect*

If the development of the practical teaching is limited to merely several practical courses, the teaching effect and development of the teaching will not be satisfactory. To carry out real teaching reform, there should be a thorough system that is reflected in the curriculum of the professional teaching plan. It is necessary to construct a complete practice teaching reform system, which requires not only the curriculum practice orientation from the junior grade to the senior grade, but also a practice teaching evaluation system. Only in this way can the reform effect be checked and the quality of teaching be guaranteed while the teaching task is being carried out.

In the course setting of product design major, a series of practical teaching plans are carried out in the course group construction from junior grade to senior grade.

The curriculum is divided into four modules: public general course group, basic course group, specialized course group and practical teaching course group.

1) *Public general courses*: The general education curriculum module mainly involves the public courses that college students must learn. It mainly aims to strengthen the cultivation of students' personality, moral ideals and emotional intelligence, and promote the harmonious development of students' abilities of "public practice" and "basic practice".

2) *Basic course group*: The basic course module of discipline mainly includes the basic courses related to professional courses, such as modeling basis, presentation skills, computer-aided design, etc. Its purpose is to train students to have a reasonable structure of professional knowledge and lay a modeling foundation for cultivating the ability of "professional practice".

3) *Specialized course group*: The specialized course module aims to teach students to learn to understand problems from a professional perspective and to gradually learn to apply professional theories to "practical project design".

4) *Practical teaching course group*: The practical teaching module mainly uses the skills teaching mode featured by project teaching, case teaching and situational teaching to cultivate students' ability to apply theory with practice and improve their practical skills. It aims to test the effect of learning in practice, develop in practice, and train students into application-oriented talents.

In the above curriculum system, each curriculum group module embodies the penetration of "practice

teaching" in different periods and stages. In this way, the continuity of practice teaching can be paid more attention to in the whole teaching system.

#### IV. CONCLUSION

The product design in China has the broad development prospect, and the high level professional product designers are in great demand in the market. Product design, as an interdisciplinary subject of art and technology, needs to strengthen the technology and ability of design practice on the basis of traditional art education. Schools with product design majors should also clarify the main direction of teaching reform, build a comprehensive practical teaching system, deepen the classroom teaching of practical courses, and train application-oriented talents who are close to the market demand of product design majors.

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