

# Study on the Difficulties and Countermeasures of Laboratory Construction and Management of the Art Design Specialty

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**Abstract**—The laboratories are an important base for training art design professionals. In the new situation, what should be done to run schools according to art rules, redefine the concept and content of "experiment" of art design specialty, and explore its construction and management of laboratory is an important issue that art design education faces at present. Based on the difficulties existing in the construction and management of art design laboratories, corresponding countermeasures and methods are put forward through analysis.

**Keywords**—art design; "experiment, internship, training and practice"; ability training

## I. INTRODUCTION

Different from those of engineering majors, laboratory construction and management of the art design specialty are mainly carried out in the following four aspects: "experiment, internship, training and practice". It focuses on cultivating students' innovative ability, cognitive ability, thinking ability, design ability, practical ability, application ability and display ability, so as to guide them to consciously try and complete the intangible construction and tangible shaping of the curriculum plan.

With the increasing demand of art design talents, the enrollment scale of art design major is expanding. Facing the current "hot environment" of art design major, it is necessary to rationally consider its "cold environment" under the social "hot environment". This "cold environment" is: insufficient teaching space, insufficient laboratory equipment, weak faculty and disproportionate staff-student ratio due to enrollment expansion. Since the laboratories are an important base for training art design professionals, it is a significant issue for the education of artistic design to re-define the concept and content of "experiment" of art design specialty and explore the difficult problems in the construction and management of laboratory of art design specialty in running school according to the laws of art.

## II. PROBLEMS IN THE LABORATORY CONSTRUCTION AND MANAGEMENT OF ART DESIGN SPECIALTY

### A. Vague Understanding of the Concept of "Experiment"

Strictly speaking, the concept of "experiment" comes from the field of natural science. The course of "experiment" in colleges and universities is a process in which students obtain new principles and methods by verifying existing scientific data or observing, collecting and analyzing new phenomena through the operation of certain instruments and equipment. However, due to historical reasons, the concept of "experiment" in the field of natural science has been used in the art design major of art colleges, normal colleges, comprehensive universities and engineering colleges, and thus the concept of "experiment" in the field of art design has not been clearly understood. This is reflected in the unclear definition of the concept and content of "experiment", equating it to the "experiment" in science and engineering, where theory teaching is the priority supplemented by experiment practice teaching and theory teaching and experiment teaching are separated in teaching method, time and place; or equating the experimental teaching of art design major with pure art teaching that only pays attention to the cultivation of students' creativity and artistic expression ability, but neglects the cultivation of their technical ability in the practical teaching of art design specialty.

In fact, the "experiment" of art and design major has its particularity, which cannot be completely equivalent to the concept of "experiment" in a strict sense. It should consist of four parts: "experiment, internship, training and practice", which is a continuation of art design theory course and a practical link from abstract to concrete. Therefore, the laboratory construction and management of the art design specialty should focus on the above four parts of research and practice.

### B. Inadequate Investment in Laboratory Equipment

The course of "experiment" for students majoring in art design is not only about theory, but also about practical experience. In the lab, students make their own design to the

visible, touchable solid three-dimensional modeling through "experiment", test the performance of the new materials through "internship", continuously improve their artistic quality through training, and improve the design and modeling ability through practice.

However, with the increase of enrollment, the equipment of art design laboratory fails to be purchased and equipped according to the course content requirements of "experiment, internship, training and practice", resulting in insufficient investment of laboratory equipment. The laboratory is open to students only in experimental lessons. In this way, the equipment is relatively limited compared with the number of people doing experiment, and inadequate at the peak time, the experimental teaching effect is poor with limited class hours. Yet in the spare time without the arrangement of laboratory courses, laboratory equipment and human resources are largely idle and not fully utilized.

### *C. Insufficient Space in Laboratories*

Small number of students, large "experimental" space, strong teacher-student interaction and the apprenticeship system are important features of the traditional "experiment" in art design major. The design teaching of Bauhaus Industrial Design School (Hochschule für Gestaltung) in Germany, the birthplace of modern art design, has basically maintained this model and achieved remarkable results. Today, the traditional "experimental" teaching mode of art design major is challenged by the expansion of enrollment.

The fine art colleges, normal colleges, as the mainstay for training art design professionals, have formed their own professional characteristics after years of school-running. In the upsurge of enrollment expansion, although the school has reformed the traditional "experiment" course teaching of art design major relatively early, the problem of insufficient "experiment" space is still serious.

In recent years, comprehensive universities and engineering colleges have established the major of art design one after another, and the enrollment of students has increased rapidly, even exceeding the running scale of art colleges and normal colleges, becoming an important base for cultivating art design professionals in China. However, due to the short running time, insufficient teaching experience, inadequate preparation, and the difference of the school's understanding of the teaching law of art design specialty, the laboratory configuration cannot meet the requirements of the "experimental" space of art design specialty. Thus, the lack of laboratory space has become a bottleneck hindering the cultivation of art and design professionals.

### *D. The Laboratory Management System Is Not Sound*

For a long time, university laboratories in China have followed the management mode of the 1950s of the former Soviet Union, which is attached to classroom teaching and managed by the teaching and research office (of the department). This laboratory management system is a closed laboratory management system that is based on curriculum setting, with single discipline, and does not facilitate

resource sharing. It does not meet the needs of the times and society, which seriously restricts the development of the laboratory and causes waste of resources. After the reform and opening up, some improvements have been made, but the situation has not improved fundamentally.

In view of the above situation, many universities have reformed the laboratory management system. They gathered the original laboratories scattered in the teaching and research departments to set up experimental centers, meeting the requirements of resource sharing and improving the utilization rate of equipment. However, the laboratory of art and design specialty is set according to the course category, which is different from the laboratory of comprehensive universities and engineering colleges. Due to the difference in understanding of the concept of "experiment" of art and design specialty, the management systems of various types of laboratory of art and design specialty are not sound.

## III. COUNTERMEASURES FOR LABORATORY CONSTRUCTION AND MANAGEMENT OF THE ART DESIGN SPECIALTY

### *A. Re-planning the Professional Laboratory of Art Design*

Art design is the integration of science and art, and "is a multidisciplinary, highly practical comprehensive discipline and a discipline that creates human life material products and spiritual products of a science in accordance with the combination of culture and art and science and technology." The construction of art design laboratory should be carried out according to the specialty characteristics and should be planned as a whole. According to the existing training programs for art professionals, the curriculum structure of art design majors mainly includes three major sections: public basic courses, professional basic courses and professional courses. The large platform laboratory of the school can be used to conduct the experimental course in public basic course, with resources shared and under the overall planning of the school. The special laboratories are required for the training in experiment courses of professional basic courses and professional courses.

There is not much investment in the construction of the laboratory for professional basic courses focusing on "training" such as design sketch, design color and construction foundation, etc. In addition to the basic equipment, the teaching space construction is the primary. As for professional courses mainly including "practical" courses such as model making, interior design, product making and design courses, the construction investment of the laboratory is relatively large, as there are relatively high requirements for the selection and procurement of equipment, the quality of experimental managers and the academic level of teachers. Therefore, on the basis of defining the concept of "experiment", the course contents of "experiment, internship, training and practice" must be clarified in the laboratory construction of art design specialty. It is necessary to arrange and classify funds according to the course content and replan the specialty laboratory of art design in a targeted manner according to the characteristics of art design specialty, so as

to highlight the teaching characteristics of art design laboratories.

#### *B. Making Innovations in the Laboratory Management System of Art Design Specialty*

At the very beginning of its establishment, laboratories of the art design specialty has partially or completely accepted the laboratory management system and mode of comprehensive universities and engineering colleges, without discussing its management system and mode from the course content, therefore it must be reformed. First of all, professional basic courses like "experimental and training" sources do not rely much on professional equipment, and special guidance from course teachers on the use of equipment is not necessary, so the round-the-clock open management is appropriate. The laboratory can be transferred to a public laboratory, and the class of course users is responsible for the management of equipment. The equipment should be counted and consigned to next class, with full-course supervision by the Lab Center. As for the laboratories for "internship" courses, the school should do research and investigation on the environment and safety of the practice base at any time, to find out problems and solve them in time. For the highly professional feature, large amount of professional equipment, high utilization rate and requirement of regular professional maintenance, the laboratories for the "practice" courses are suggested to be managed by the teaching and research office (of the department), and the laboratory center should be responsible for safety supervision, resource allocation and sharing, equipment maintenance and other large-scale management

#### *C. Realizing the Combination of the Four Experimental Teaching Forms of "Experiment, Internship, Training and Practice"*

Since experimental teaching has its own characteristics and rules, to realize the combination of "experiment, internship, training and practice" efforts should be made to see experimental teaching from an integral and systematic perspective and plan the setting of experimental courses according to the training objectives of different majors. It is necessary to break down the barrier of theory classes that are originally attached to each experimental class, make scientific overall optimization design, comprehensive arrangement of experimental content and select experimental projects according to the purpose of experimental teaching, so as to implement scientific and systematic management of experimental teaching. In this way, a main line of experimental teaching can be formed, so as to realize the fundamental transformation from teaching experiment to experimental teaching.

It is necessary to carry on the overall design to the experiment teaching and take the four years of experiment teaching as a whole. According to the subject categories, various experimental courses should be set up independently, and the experimental course should be treated and arranged as an independent course. Attention should be paid to the connections before and after the course so as to form a spiraling organic whole with internal connections step by

step. Experimental teaching credit system can be implemented to allow students to freely choose the content of experimental teaching and time of experiment. As long as the intended experimental teaching purpose is achieved, the student can be confirmed to have completed the experimental teaching task.

#### *D. Accelerating the Construction of Experimental Teachers*

Teachers and laboratories are the carriers of experiments, and the teaching and management of experiments are inseparable from high-quality teachers. In the whole experimental teaching, students are the main body of practical activities. In this process, teachers and laboratories are like the water and students the ship on it. Water can carry a boat or overturn it. Colleges and universities should speed up the construction of experimental teachers, gradually dilute the boundary between theoretical teachers and experimental teachers, and advocate the integration between theoretical teachers and experimental teachers, as well as the communication and complementarity in professional work. The backbone of teaching and research personnel should be encouraged to actively participate in laboratory construction and undertake experimental teaching tasks, and strive to build a rational structure and high quality experimental work team composed of full-time teachers. At the same time, great importance should be attached to the professional improvement of managers, and managers should be sent to study, inspect and investigate in other colleges and universities in a planned way, so as to familiarize them with the performance of equipment and improve the level of laboratory management.

#### *E. Strengthening Cooperation with Practice Units of Social Design in Running Schools*

Enterprises and institutions inside and outside the university are the terminus of the transportation of art design professionals. To train art design professionals, schools should be oriented to the social demand, face the society, and strengthen the cooperation with the social design professional units in the construction and management of the laboratory according to the "experiment, internship, training and practice" curriculum system of the art design major. It should make full use of the advantages of social forces and relatively complete equipment, put a part of practical, high equipment requirements of the "experiment" course teaching, directly into the social design professional units, so that students can have more, faster, better and earlier communication with the society. In the construction of art design teaching practice base, different teaching sites can be selected according to the regional and professional characteristics of each design college. Design companies with a certain scale, strength, characteristics and suitable specialties can be selected, and a long-term friendly cooperative relationship can be established to supplement the deficiency of experimental teaching in the school.

## IV. CONCLUSION

The laboratory of art design specialty is an important base for the practice teaching of art design in the school. So,

the construction of laboratory is a long-term task of school development. Schools should take the characteristics of art design major into account, constantly improve the construction and management of art design professional laboratory, and straighten out the relationship between art design professional laboratory and other school laboratories according to the "Rules for the Laboratory Work in General Institutes of Higher Education". In this way, the resources sharing and advantages complement can be realized to ensure the scientific, standardized and efficient operation of the laboratory construction and management of the art design specialty.

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