



Exploration on building and sharing experimental teaching demonstration center under the background of integration of industry and education

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Abstract. In recent years, with the deepening of teaching reform, the investment in university laboratories has significantly increased, especially in the context of "Integration of industry and education", the talent training model of undergraduate colleges has changed from academic to application oriented, and university laboratories have played a more significant role in achieving the goal of cultivating application-oriented talents with innovative ability. Starting with the construction of the existing provincial experimental teaching demonstration center, combined with the problems in the development of the laboratory and the attempts in innovation, this paper analyzes and discusses the introduction of external resources such as enterprises, the co-construction of a laboratory platform featuring resource sharing, flexible mechanisms, diverse cooperation, and win-win cooperation, the strengthening of the construction and management of open laboratories in local universities, the training of innovative talents, and the realization of quality education, boost the new development of practical teaching reform in colleges and universities.

Keywords: Integration of industry and education; Co-construction and sharing; Experimental teaching demonstration center

1 Introduction

At present, the structural contradictions in higher education and the urgent need for applied and innovative talents in enterprises largely determine the symbiosis of the fate of external resources such as enterprises and universities. As an important practice base for teaching and scientific research innovation in universities, laboratories are also an important department for cultivating applied talents. In view of this, exploring the establishment of a shared experimental teaching demonstration center under the background of integration of industry and education has become an important direction in the construction and reform of university laboratory systems

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The integration of industry and education is an important symbol of university achievements and talent output, and is also one of the positioning of national and provincial experimental teaching demonstration centers. ^[1] In 2019, the College's Design and Art Experimental Center was approved for the provincial "13th Five Year Plan" key construction of an experimental teaching demonstration center, which has since started the exploration of innovative model construction for design discipline laboratories. Taking the construction of an experimental teaching demonstration center as an opportunity, combining the characteristics of the art discipline and the advantages of comprehensive universities, to promote the development of the integrated teaching model of production and teaching.^[2]

2 Overall Structure of Experimental Teaching Demonstration Center

The Training Center of the Academy of Design and Arts has a floor area of 13000 square meters, with a total of 17 training rooms, which are generally divided into specialized training rooms and public experimental teaching centers serving three professional directions: visual communication design, environmental design, and product design. An independent laboratory with three professional characteristics and a shared public training and teaching space will be formed. The public training room includes a studio, traditional handicrafts, advertising practice, screen and printing, lacquer art, Ou kiln, model forming, carpentry, copying and copying room, and other training rooms. There are 5 professional training rooms, 6 skylight studios, design art exhibition halls, props rooms, arts and crafts exhibition rooms, design exchange centers, multimedia lecture halls, and a series of comprehensive training and teaching venue composed of professional design classrooms, etc.

3 Curriculum and Faculty Allocation of the Experimental Center

Introducing inheritors of intangible cultural heritage to the campus, exploring new paths for the creative transformation of traditional handicrafts in the context of modern society, and developing a series of courses that organically combine traditional handicrafts and modern design with local characteristics, such as "Research on Local Intangible Cultural Heritage and Traditional Arts and Crafts", "Lacquer Art and Contemporary Design Language", "Regional Culture Research", "Research on Successful Cases of Three Innovations", "Traditional Handicrafts", and "Cultural and Creative Design".

4 Construction Objectives of the Experimental Center

The experimental courses developed by the Experimental Center can basically reflect the experimental teaching objectives of the three cultivation levels of "basic skills - comprehensive design - innovative design". Through the reform, the experimental parts of different semesters have undergone improvement training from experiments to verify the principles, to experiments in the design category, and then to comprehensive application and innovation experiments. The rational allocation of comprehensive, designed, and innovative experiments has been strengthened, transforming traditional knowledge and skill based experimental teaching into student ability cultivation, providing favorable conditions for students at different levels and with different professional foundations to cultivate innovative talents with multiple abilities, further improving the overall level of experimental teaching. [3-5]

5 Construction Strategy of Experimental Center

In response to the problems existing in the operation of the laboratory, it is currently necessary to further establish a system for cultivating innovative talents and an interdisciplinary, shared, and open experimental demonstration center.

The open sharing of laboratory resources is a multifactorial and systematic project [6-7], which is an important way for universities to participate in social services and achieve mutual assistance between universities and society. College laboratories are an important platform for teaching and scientific research. Open management of college laboratories is an important way to effectively utilize laboratory resources, improve equipment utilization, and cultivate first-class innovative talents. [8-10]

6 Implementation Process and Results of The Construction of The Experimental Center

The training center broadens its service functions and enhances its social adaptability in accordance with social needs, professional restructuring, and professional construction; Integrating teaching, scientific research, and service, strengthening links with industries and enterprises, and playing a radiating role in surrounding areas. Meet teaching requirements, highlight the cultivation of artistic quality, and become a platform combining "production, learning, and research", a window of social service. Establish advanced educational concepts and practical teaching concepts, establish a practical training and teaching system for design art that meets social needs, and build a three-level practical training foundation platform of "basic skills, professional skills, and comprehensive skills."

6.1 Laboratory Opening Project

Teachers organize student groups to apply for funding, and the college approves the funding. Combining professional courses and practices, the college comprehensively utilizes internal and external resources to carry out laboratory related projects. The college has applied for and implemented more than 40 open laboratory projects annually, and conducted project-based discussions in the form of teachers leading small groups of students. The project results include practice reports, design works, design drawings, and patents. By carrying out laboratory opening projects, students' practical and research abilities have been greatly improved, as well as the utilization rate of laboratories and the conversion rate of teaching and research achievements.

6.2 Establish a Project Product R&D Team

Relying on the teaching platform of universities, establish a research and development team of university teachers, intangible cultural heritage experts, inheritors, students, and cultural and creative companies. Interpret the cultural genes of traditional design, refine high-quality elements, combine market demand, find innovative research and development approaches, solve material and process bottlenecks, develop systematic cultural and creative products, and activate products. The faculty team of the college has visited intangible cultural heritage protection units in Lucheng District of Wenzhou City several times, and has taken the college team as the main body to jointly establish a provincial traditional arts and crafts workstation called "Ouyue Baigong" with Wenzhou Arts and Crafts Research Institute Co., Ltd. and Wenzhou Ouyue Art Creativity Co., Ltd., organizing the faculty team to conduct group work on Ou kiln firing, bamboo silk inlaying Innovation and promotion of intangible cultural heritage related projects such as color stone inlay and lacquer ware production.

6.3 Adopt the "Double Qualification System" Teaching Mode

The college is rooted in Wenzhou's unique regional economy and culture, and based on the goal of cultivating applied technology talents. In October 2008, it began the educational exploration of integrating Wenzhou intangible cultural heritage projects with art design courses. It has undergone four stages: project research, practical training construction, curriculum integration, and design innovation. It has reconstructed the curriculum system that integrates local intangible cultural heritage, and adopted the "dual teacher system" teaching mode, Achieved the integration and innovative promotion of intangible cultural heritage handicrafts in design and art courses, completed nearly 20 school local and school enterprise cooperation projects related to intangible cultural heritage, and delivered over 30 expert lectures. Three mature off-campus practice bases have been established. In teaching, intangible cultural heritage inheritors work closely with professional teachers to collaborate in teaching and design based on the characteristics of intangible cultural heritage projects. In the course, intangible cultural heritage inheritors teach and demonstrate the project's tools, materials, operating skills, and technological processes. Professional teachers analyze the project's

domestic and foreign status, outstanding design works, and development trends, providing students with creative thinking.

6.4 School Local Cooperation and Promotion

In Ouyao Town of Yongjia and Taoshan Research Institute of Ruian, there are three product research and development bases built to provide a platform for students to innovate and start businesses, and form a cluster effect to radiate surrounding areas. In the rural revitalization plan, the role of "point to area" (planning of Taoshan Town) is achieved. In cooperation with Wenzhou Municipal Publicity Department, Wenzhou Municipal Intangible Cultural Heritage Center and other departments, the College has jointly held three campus activities for the "100 industries of Wenzhou Intangible Cultural Heritage", organized the "Wenzhou 2020 Provincial Intangible Cultural Heritage Representative Project, Representative Inheritor Evaluation Work", and participated in the revision of the construction standards for Wenzhou Intangible Cultural Heritage Experience Base and the implementation standards for Wenzhou Intangible Cultural Heritage Residents' Accommodation, making contributions to the construction of Wenzhou Intangible Cultural Heritage.

6.5 Strengthening Local Services

Build a professional off-campus practice base and create an organic system that serves the local community and nurtures the classroom. Through strengthening school-enterprise cooperation, rural revitalization, innovation of small and medium-sized enterprises, and internship practice bases, the deep integration of universities and local areas is achieved, and the organic unity of value guidance and professional capabilities is achieved. Establish strategic relationships with local villages to achieve dual benefits of local service and feedback classes. During the summer vacation, the teacher led the student team to conduct research and implement rural revitalization activities in the countryside, and combined with professional characteristics to seek countermeasures for regional rural revitalization. The village based project team developed and implemented a number of revitalization plans, including tourism space design such as homestays, design of locally sourced cultural and creative products, and online and offline promotion channels for agricultural products. It has effectively provided a feasible rural revitalization plan for the village, and at the same time, in the Zhejiang Rural Revitalization Competition, the students have achieved good results in multiple levels of awards such as the first prize.

6.6 Significant Achievements in Discipline Competitions

In experimental teaching, students are encouraged to participate in various competitions and exhibitions at all levels, participate in teacher research projects, and often hold seminars and awards for student works, effectively promoting students' enthusiasm and initiative to participate in experiments. The competition is a process of stimulating students' interest and potential in experiments.^[11-13] In practice, it cultivates and

enhances students' innovative ability, practical ability, and team awareness.^[14] Student participation in discipline competitions has increased year by year. In the past three years, students have participated in various discipline competitions and won more than 200 awards, nearly 50 national first-class competitions, and 8 innovation and entrepreneurship projects have been approved. The equipment and resources of each professional training room and public training room are open for use by participating students, improving their ability to integrate "art + technology" into innovative practice. At the same time, relying on industrial culture research institutes and professional studios (workshops), the module teaching system is launched, driving the transformation of teaching effectiveness from professional modules, research institute modules, project modules, competition modules, and other fields. Facts have proven that, The innovative application and practical abilities of students have been greatly improved, providing a guarantee for the realization of the training objectives of applied talents.

6.7 Cooperation Between Schools and Enterprises for Development

The college has signed school-enterprise cooperation agreements with more than 40 local decoration and design companies, furniture companies, creative design companies, cultural tourism companies, network technology companies, industrial design bases, interior design companies, advertising companies, cultural and art companies, graphic design companies, and other companies in Fujian, Guangzhou, Hangzhou, and Wenzhou, including Yueqing, Yongjia, Rui'an, Cangnan, and other places, Regularly organize students to go to the practice base to carry out extracurricular practical courses in visual communication design, environmental design, and product design classes. Through integrating theory with practice, students can apply what they have learned, laying a good foundation for better adapting to the needs of enterprises and society; At the same time, teachers undertake horizontal projects for enterprises, lead students to carry out research, and solve technical bottlenecks for enterprises. The project funds range from tens of thousands to 400000 yuan, promoting in-depth cooperation and common development between schools and enterprises, forming a healthy development and improvement of production, teaching, research, and learning.

At the same time, the Experimental Center of the College has hosted and undertaken a number of intangible cultural heritage inheritance learning projects and design competitions, replacing learning with promotion, and expanding its reach to the social level. The 2018 Zhejiang Non Heritage Inheritance Group Training Project (Shaping) provided learning and training for 60 national, provincial, and municipal intangible heritage inheritors in Zhejiang Province; In 2019, 80 intangible cultural heritage inheritors in Ningbo were trained.

By the end of 2022, the experimental center of the college had passed the acceptance of the provincial key laboratory, and was successfully approved as a provincial key laboratory in Zhejiang Province, which benefited from the overall improvement strategy of taking multiple measures in the construction of the provincial experimental teaching demonstration center.

7 Conclusion

In the development of provincial experimental teaching demonstration centers, we will continue to explore new models of industry-teaching integration that are suitable for the development of disciplines. The laboratory will cooperate with other disciplines within the school and various external organizations to build experimental demonstration centers, fully utilizing the funds and equipment of enterprises and the scientific research technology of the school, achieving resource sharing with enterprises, and cultivating scientific and technological innovation talents for society. Take the opportunity of vigorously developing the dual qualification model at this stage, strengthen the connection between enterprises and universities, use the scientific research technology of universities to solve the development bottleneck of enterprises, formulate joint experimental plans based on the future development direction, drive students to participate in competitions and scientific research projects, and ultimately build a bridge between teaching and scientific research and industrial demand.

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