

## Comparison of Teaching Innovation Models for Undergraduate Graduation Design in Domestic Environmental Design Majors

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**Abstract:** At present, many universities in China have established environmental design majors. However, compared with foreign countries, domestic environmental design professional education started late. Although it has a large scale of environmental design professional education, it is still in the exploration stage in the talent training mode. As far as graduation design teaching is concerned, it focuses too much on subject theory and ignores practice theory; it focuses too much on the use of learned knowledge and neglects the introduction and study of new knowledge and methods in production practice. As far as the graduation design works of college undergraduates are concerned, it is found that more content is empty, lacking connotation and innovation, and completely stays at the visual level of conceptualization, formalization and representation. As a result, the comprehensive design of graduation design teaching is insufficient for students. The actual effect and the demand for students' practical ability and innovative ability are quite different, and there are different degrees of disconnection. The main problem is reflected in the four topics of graduation design, the selection mode, the guiding mode, the creative process and the assessment system.

### 1. Introduction

Most colleges and universities are directly assigned by the instructor, and the topic has certain blindness and randomness. As a result, more graduation design topics are too large or too small, lacking practical design value, and poor operability; or there are single types of topics, narrower scope, lack of novelty [1]; In particular, in the face of virtual design topics for design and implementation, "false fake", "paper talk" and other issues. As a result, graduation design can not truly achieve the purpose of testing the professional level of students, and can not truly reflect the development of environmental design profession.

The majority of universities in China still adopt a single mentor-led model. This "one-to-many" model not only guides teachers' workload and efficiency, but also neglects the exchanges between different disciplines. The knowledge that students can learn from teachers is very limited, which seriously restricts the expansion of students' horizons. And the improvement of innovation ability [2]; is not conducive to mobilizing the enthusiasm and initiative of students, which is not conducive to the realization of the goal of compound application talents in environmental design profession.

In the creative process of graduation design, the most prominent problem is that the emphasis on the research and analysis stage is generally insufficient and in the form. Students over-reliance on the Internet, the information collected is not comprehensive enough, lacks authenticity, the data is not organized and analyzed in depth, and subjective awareness is strong, resulting in insufficient innovation of design schemes [1].

The existing graduation design assessment system in domestic universities pays too much attention to the results assessment, neglects the process evaluation, and the proportion of the final defense results is too large, so that it can not objectively and truly reflect the graduates' attitudes towards the graduation design and the level of professional technical skills. . The evaluation system of graduation design results is still extensive, the scoring rules are not detailed enough, subjective is too strong, and it is easy to dampen some students' enthusiasm for graduation design [3].

## 2. Exploration of the teaching mode of graduation design for environmental design major

In view of the above reasons, the quality of teaching design for college environmental design graduates has brought serious problems, which cannot meet the requirements of current society and industry for environmental design professionals. Therefore, it is very urgent to explore a new model of graduation design teaching! The following is an analysis and comparison of several domestic models for the design reform of graduation design for environmental design majors.

The teaching model of school-enterprise cooperation originated in the United States. In 1906, the cooperation education of Herman Schneider, the faculty of the University of Cincinnati, began. Nowadays, colleges and universities in Europe and the United States have become very common, and a diversified school-enterprise cooperation model suitable for the country and with different characteristics has been formed. School-enterprise cooperation can be said to be an inevitable outcome of the market economy. There are two main modes of graduation design teaching for school-enterprise cooperation: one is composed of experts, scholars and engineers of school-enterprise, and the defense committee is mainly responsible for the graduation design's defense and performance evaluation, and the graduation design guidance is still The school's tutor is responsible; the other is the school-enterprise joint "double tutor system" graduation design, practice integration mode, guided by the graduation design by the school-enterprise tutor group. In comparison, the first model is only an intensive examination of the graduation design, and does not actually solve the problem of the disjunction of the traditional graduation design teaching; and the second graduation design and practice integration model is implemented into the actual teaching. In the process, the design of the graduation design of the environmental design profession is closely integrated with the industry, to achieve the advantages and disadvantages between the school and the enterprise, the reasonable matching of resources, and the zero-docking of all aspects of the operation mode, to fundamentally solve the "paper talk" in the graduation design. Phenomena and graduates face a series of problems such as poor practical ability, insufficient innovation and weak work adaptability, which are effective measures to improve the quality of graduation design.

Graduation internship is the final stage of the environmental design major, which plays a leading role in the graduation design work. Compared with other courses, it can make students closer to the actual project and solve the opportunity to provide practical venues during the normal teaching process [4]. The school-enterprise joint "double tutor system" graduation design and practice integration model can not only meet the needs of enterprises for environmental design professionals, but also provide more practical projects for graduation design topics (ie, The fact that enterprises produce first-line or real-world problems with actual backgrounds has changed the way that college instructors directly designated them. However, in the process of implementation, there are two important prerequisites: First, it is necessary to establish a long-term cooperation mechanism between the university and the enterprise to achieve the integration of school management and enterprise management mode. Colleges and universities need to change the previous single-school graduation design teaching mode, allowing students to go to relevant companies for internships during the graduation design process, and the company supports students to complete the graduation design during the internship process. The second is to actively promote the "double tutor system" to clarify the responsibilities of the instructors inside and outside the school. In the process of guidance, the instructor of the school is the first responsible teacher of graduation design. He is mainly responsible for the writing of the dissertation of the students, communicating with the cooperative enterprises, solving the problems encountered in the graduation design of the students in the enterprise, and regularly checking the graduation of the students. Work on the progress of the design, etc., to ensure that the graduation design of the students is completed on time; the enterprise instructor is mainly responsible for solving the technical problems encountered in the practice of the student engineering design project, and assisting the instructor in the school to complete the assessment of the graduation design results and to train the student team. Cooperation awareness [4].

The studio-based teaching model can be traced back to the Bauhaus era design workshop-style

teaching system, which combines the apprenticeship and art training taught by craftsmanship, that is, the combination of workshop and classroom. It can be said that it is the prototype of modern studio design education [5]. The studio-based graduation design teaching mode is based on the studio as a carrier, emphasizing the design project as the basis, insisting on establishing a teaching environment that is in line with the actual work scene of the industry, focusing on the improvement of students' design practice ability and innovation ability, and will practice A teaching model that integrates teaching and technical services. At present, developed countries in Europe and the United States have become more and more perfect in studio design teaching. In particular, German design education follows the teaching traditions and systems of Bauhaus, and adheres to the combination of art and crafts, science and technology and art [5]. In China, some institutions have also achieved good results in the construction of studio teaching according to their own characteristics, such as the Central Academy of Fine Arts, Guangzhou Academy of Fine Arts, Jiangnan University, etc.; most colleges and universities are still teaching the studio-based teaching model. The exploration phase.

The studio-based graduation design teaching mode is an open and close to the actual production and design process environment. It mobilizes the environmental design students' enthusiasm, initiative and creativity in graduation design, and promotes the integration of teaching, practice and production. Large push effect [5]. However, in the actual operation process, relying solely on the studios established by the universities themselves, the resources are limited, and they cannot meet the needs of graduation design teaching, so that each student enters them. Secondly, it is difficult to ensure that the quality of the graduate design in the studio-based teaching mode is significantly improved in view of the current lack of "double-skilled" backbone teachers in the environment design teachers in China. Therefore, the best solution is to strengthen school-enterprise cooperation. Schools and enterprises jointly set up studios, which can be placed in schools or in enterprises. The faculty is composed of university teachers and enterprise experts to achieve resource optimization. In this way, the student's graduation design can get the correct guidance and rich practical experience in the studio, and the innovation ability and professional ability can be cultivated.

The inter-school joint teaching mode refers to the joint teaching practice and exchange activities between the sister universities with the same major, which can be between the same city, the same province or even the universities in different regions of the country. The purpose is to strengthen exchanges and learning between professional teaching in colleges and universities, and to improve their respective levels of running schools. In fact, this kind of macro-level joint teaching mode between colleges and universities has long been commonplace. As early as the 1950s, the Ivy League appeared in the world due to social and sports events. At present, the mode of joint design of graduation design between schools has gradually attracted the attention of domestic colleges and universities, and has carried out active explorations, such as the "eight schools of integrated architecture undergraduate graduation design practice teaching [8]", that is, 2007 It was initiated by Beijing Jianshu University in conjunction with Tsinghua University and Southeast University. From the six schools of the year to the seven schools in 2008, it was developed into eight schools in 2009 (Tsinghua University, Tongji University, Southeast University, Tianjin University, Zhejiang University, Central Academy of Fine Arts, Chongqing University, Beijing University of Architecture) [6], a basically stable membership structure. The activity is carried out annually by one of the universities to undertake the principle. The topic of graduation design is selected by the host school to select the real plot of the typical city. The content mainly focuses on urban design and architectural design. In the medium term, there will be a unified evaluation of the teachers of the eight universities. The final design results will be reported and exchanged, and the results of the joint teaching will be presented to the public in the form of exhibitions and book publishing. This kind of inter-school joint graduation design practice has played a big role in the environmental design professional education. Therefore, in 2009, the four colleges and universities of the Academy of Fine Arts of Tsinghua University, Tianjin Academy of Fine Arts, Central Academy of Fine Arts, and Art and Design Department of North China University of Technology jointly conducted the "Graduate Design of Environmental Art and Art in the Four Schools and Four Instructors" [6]. It can be said that this is the earliest attempt and exploration of the joint practice teaching of

undergraduate environmental design majors. However, for the inter-college joint graduation design teaching, the proposition must fully grasp the difference between the knowledge structure and the actual design level of students from different cooperative universities.

In addition, in 2013, the Interior Design Branch of the Architectural Society of China hosted the “Interior Design 6+1” school-enterprise joint graduation design, which is an educational platform jointly created by universities and well-known design companies, namely the “Excellent Engineer Education and Training Program” of the Ministry of Education. Under the guidance, including Tongji University, South China University of Technology, Harbin Institute of Technology, Xi'an University of Architecture and Technology, Beijing University of Architecture, Nanjing University of Art, Zhejiang University of Technology, seven colleges and universities combined with the actual project of the graduation project. It aims to strengthen the pertinence of indoor architect training and promote the exchange of relevant universities in the construction of interior design disciplines and professional education. Each year, the local design companies of the colleges and universities will issue questions. The topics are aimed at social hot issues and have a distinct sense of the times, providing a good design practice for graduates of environmental design graduates.

The interdisciplinary teaching mode, that is, the way in which graduates of different majors jointly graduated, is to transform the “one area more” status of most colleges and universities into the form of “multiple mentor joint guidance”. This teaching mode is a breakthrough and innovation in the traditional graduation design teaching mode. It not only integrates teaching resources, strengthens the communication between various disciplines, but also broadens the students' horizons; it is not only conducive to the cultivation of interdisciplinary composite application undergraduate talents, but also conducive to students to acquire cross-professional vocational skills and expand employment. As a comprehensive interdisciplinary subject, environmental design requires the support of other disciplines such as architecture, aesthetics, psychology, ecology, and gardening. However, the cultivation of environmental design talents in domestic universities is limited to the internal disciplines. However, the cultivation of adjacent interdisciplinary subjects is less [7]; the training of this professional knowledge is more important, and the expansion of relevant professional knowledge is neglected; the lack of overall thinking and the cultivation of overall concepts and the attention of graduates to diversified trends. Therefore, in order to meet the needs of the society and realize the requirements of interdisciplinary training of talents, it is necessary to establish an interdisciplinary teaching model for graduation design. In foreign countries, interdisciplinary educational thinking has been around for many years. For example, as the pioneer and leader of interdisciplinary teaching and research in the United States, Stanford University has always advocated multidisciplinary teaching and research in interdisciplinary fields [8]. At present, many domestic universities have begun to explore and experiment with interdisciplinary teaching research, mainly including inter-disciplinary joint teaching and inter-school inter-disciplinary joint teaching.

The inter-disciplinary teaching mode refers to the teaching practice of graduation design by different professional students and teachers in the same university. It can be either a secondary college or a secondary college. As early as 2002, Nanjing University of Science and Technology tried to combine industrial design with other majors, and formed all the students into a “graduate design team”. Then the simulation company divided the students of different majors into four groups: marketing, finance, structure and modeling. Organization planning, market research, financial analysis, product design and development, and marketing advertising marketing require four months to complete the entire process of a smart toy from product development to preparation for market [6]. Finally, the defense committee is composed of different professional teachers to evaluate the scores.

Inter-school inter-disciplinary teaching mode refers to different majors with similar attributes in colleges and universities in different regions. On the basis of scientific division, the joint teaching practice of graduation design is carried out around university subjects (such as large buildings, large machinery, large transportation, etc.). In 2009, the “2009 Graduation Design Camp” joint graduation design teaching was carried out by the Central Academy of Fine Arts School of

Architecture, the Department of Architecture of the Shanghai University Academy of Fine Arts, and the Environmental Art Design Department of the Guangzhou Academy of Fine Arts, which provided a base for each of the three universities. Students are arbitrarily selected, and then a group of teachers from three school teachers conduct joint counseling and comment design. This is the first cross-professional joint teaching exploration of architecture and environmental design education between domestic art colleges [6]. At present, inter-university inter-disciplinary teaching with great influence in domestic universities is “UC4 Teaching Alliance”, which was established in 2014, and is composed of four cities in Xi'an University of Architecture and Technology, Chongqing University, South China University of Technology and Harbin Institute of Technology. The comprehensive joint graduation design teaching of the three majors of architecture, urban and rural planning, and landscape architecture of the university [8], with urban design as the link, completes multiple levels including urban planning, architectural design and landscape design. Comprehensive design results. The aim is to integrate inter-disciplinary resources through different regions, to promote inter-disciplinary and cross-school exchanges and cooperation, to jointly improve undergraduate teaching level, share teaching resources, and expand students' geographical horizons. The operation mode is organized by one of the host universities each year, responsible for site selection, proposition and centralized teaching. The schools send three professional instructors and students to participate in the on-site investigation, mid-term evaluation and Joint teaching links such as graduation defense. The opening of the defense is carried out in the host university, while the mid-term inspection and final outcome defense will be conducted in other universities. The student team adopts a free organization and cooperation model, from the pre-analysis, concept design to program design, technology realization, normative expression and other whole process training, requiring three professional students to participate collectively, cooperate with each other, and coordinate design to jointly complete the city in the designated area. Design, architectural design and landscape design. In the completed package, students need to establish the concept of “big building” for interdisciplinary collaboration, and have the consciousness of integrating disciplines to realize the mutual support, support and supplementary relationship of the disciplines of “Architectural, Planning and Landscape”. From 2014 to 2017, it completed the “Xi'an Happiness Forest Belt – Freshmen and Development”, “Reconstruction and Activation – Harbin Port Authority Regional Urban Design”, “Guangzhou Xinzhong Axis Southern Section Urban Renewal”, “Chongqing Sand Magnetic” Four topics in urban design of cultural districts; hosted by Xi'an University of Architecture and Technology in 2018, the location of this joint graduation design is Hancheng Ancient City, titled “Guardianship and Development – Urban Design of Hancheng Ancient City Area” to explore the new situation Active countermeasures for the protection and development of historical and cultural cities.

The interdisciplinary teaching mode is a kind of scientific creative activity that breaks the boundaries between different disciplines and crosses different research fields. It will be the trend and research hotspot of education and teaching in the future. Environmental design majors and urban and rural planning, landscape design, architecture, civil engineering and other complementary majors have broad prospects for joint graduation design. In order to make the interdisciplinary graduation design teaching mode better implemented: First, the establishment of interdisciplinary training methods requires students to have a comprehensive and solid knowledge structure. It is necessary for a group of professional teachers from different disciplines to form a strong team of joint instructors. The professional complementarity should be considered as much as possible, and their respective responsibilities should be clearly defined to form a good atmosphere for discussion. Secondly, whether it is a cross-professional joint graduation design between the school and the inter-university, it is necessary to fully consider the professional participation of the graduation design topic type; then, determine a complete task book, including the difficulty of the project design, drawings The depth requirements of the completion can meet the basic requirements of the graduation design of each major, and can also play the advantage of joint teaching.

### 3. Conclusion

Exploring the direction of the graduation design teaching reform of environmental design majors in colleges and universities, seeking the innovation of practical teaching methods and concepts, the school-enterprise cooperation, studio system, inter-school joint, interdisciplinary joint graduation design teaching mode will become the future development trend of college education and teaching. No matter which mode is adopted, it is first necessary to establish a good coordination mechanism to achieve effective use of resources, to expand the scope of the topic selection and to optimize the guidance mode; secondly, to strengthen process management, strengthen students' practical ability, and expand students' Knowledge structure, improve students' ability to innovate, analyze and solve problems comprehensive ability; at the same time, it should also establish a scientific and rigorous, fair and impartial assessment system. Through the innovation of graduation design teaching practice, the level of graduation design of environmental design students and the guidance level of professional teachers will be improved.

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