

Research on Teaching Reform and Practice of Graduate Design for Environmental Design Major Based on OBE Concept under the Background of New Liberal Arts

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Abstract: Graduation design is the most important course in the curriculum system of college design majors. With the advent of the information age, single disciplinary talents can not meet the needs of the industry and society. The concept of OBE has been integrated into the teaching reform of graduation design curriculum, which is an important measure to implement the interdisciplinary talent training advocated by the construction of "new liberal arts" in our country. Based on the analysis of existing problems in the teaching mode of college graduation design, the concept of OBE is introduced into the curriculum of graduation design for reform and practical research, which is discussed from five aspects, including the establishment of curriculum education objectives, the selection of topics based on results-oriented planning, school-enterprise cooperation and studio cooperation in education, cross-border integration of talent training, the theory of discipline competition results feedback and future planning. It is expected to broaden students' horizons effectively and promote colleges and universities to cultivate innovative, internationally competitive and interdisciplinary application-oriented talents in line with industry needs.

Keywords: *New Liberal Arts; graduation design; OBE concept; teaching reform*

1. Introduction

Since the new liberal arts was proposed in 2018, it has become a hot topic of teaching and reform research in major universities. In line with the cross-disciplinary qualities of design that have been embodied since the birth of design, the new liberal arts' guiding ideologies of cross-disciplinary integration, cross-border cooperation, and cultural education also indicate the direction of environmental design majors' education and teaching reform in today's colleges and universities. OBE, or outcome-based education, was initially put forth by American researcher Spady W.D. in 1981. It is a "student-centered" and "results-oriented" educational approach. OBE has developed over many years into a crucial component of education. OBE has been completely embraced by engineering education professional certification and has emerged as the standard idea for educational reform in the US, the UK, Canada, and other nations. Many academics in China are currently implementing the OBE education concept into the instruction of art and design majors. The research is done in a practical setting and focuses mostly on developing curricular systems within the framework of OBE, assembling teaching teams from instructors, curriculum ideology, blended learning, teaching practice modes, talent cultivation modes, and professional course teaching reform. For example, in the book "Professional and Curriculum Construction Based on the OBE Concept" written by Xiangping Liu and Hongmei Zhou ^[1], including dozens of articles from the Dong Guan Institute of Technology that explore educational and teaching reform in the areas of talent cultivation, curriculum construction, specialization construction and economics. The articles involve group thinking in these fields as well as in literature, arts, engineering, management, and education. The OBE concept serves as the guiding ideology throughout. The results-oriented education (POT-OBE) teaching method was proposed by Hong Zhao ^[2], and it is based on the cognitive model of problem logic. Wu Turning and Zhao Junxue ^[3] studied innovative talent cultivation under the OBE concept, looking at factors like expected learning outcomes, building innovative talent cultivation course cluster systems, and optimizing feedback on learning outcomes evaluation.

To sum up, the combination of OBE teaching ideas and college talent training is a hot topic and trend in Chinese higher education research, and this research is based on the accomplishments of this area.

Research on the "new liberal arts" and "OBE concept" in conjunction with applied talent training styles, nevertheless, has not been done by many scholars. Consequently, there is a dearth of study on its application to art design graduate projects, which leaves this paper with a lot of unexplored territory.

2. The Common Problems Existing in the Current Graduation Design of Environmental Design Major

2.1 Outdated Educational Concepts and Lack of Individualized Teaching

When it comes to environmental design education, the majority of Chinese colleges are still quite conservative and lack innovation. With students completing a series of design programs or creating a series of spatial design models as the final products of the graduation design, teachers' teaching concepts are out of date, and the graduation design teaching goal remains unmet. The course focuses on "classroom, curriculum, and textbooks" since the graduation tutor's "teaching and understanding" are crucial to the learning process. The tutor's own experience also influences the program's quality and the topic of graduation design. As the ones receiving education, students lack initiative and rely more on their supervisors. Additionally, due to the graduation design course being required to be completed in the fourth year of undergraduate studies, it takes a minimum of six months from the time the topic is chosen to its completion. The length of the teaching cycle and the period are also factors, as is the teacher-to-student ratio, which results in a lack of rigor and a lack of engagement on the part of both teachers and students. Lastly, the teaching process is not sufficiently interactive, making it impossible to implement customized instruction and education.

2.2 Major Boundaries Are Clear and Students Have Narrow Horizons

Graduation design courses are built on professional theory and practical expertise acquired during the first three years of undergraduate study. Most art design programs at colleges and universities free of arts and crafts uphold the divided professional mode of traditional art teaching, with distinct major boundaries and barriers, and cultivate "sharp, refined, and specialized" talents. Because of this, each major's graduation design displays a singular disciplinary thinking mode, making it difficult to "break the wall" and preventing the integration of design disciplines and interdisciplinary instruction. This leads to a lack of creativity and loose thinking on the part of the students, which lowers the caliber of the graduation outcomes. In the era of big data and AI design, the design sector needs highly culturally literate and comprehensive large design professionals who can use technology. However, most college-trained designers are narrowly focused on their specialties, capable of solving only a few project challenges in the senior design course or even returning to the same topic year after year. The new liberal arts demand a broad vision and comprehensive competence, which are at odds with the absence of innovation and the application of multidisciplinary thinking to solve design challenges.

2.3 Weak Humanities Knowledge and Lack of Practical Skills

Due in part to the low percentage of cultural courses allotted to art students in college enrollment restrictions, the majority of students entering art and design institutes have a weak foundation in these subjects. Colleges and universities provide professional courses in the humanities, sciences, and history, but students simply sign up for programs to get credit. They are not particularly conscious of how knowledge of the humanities, sciences, and technologies benefits their body and mind and will help them in the future when they are creating things, and they have no desire to take humanities classes outside of their majors, either obligatory or elective. Teachers in specialized courses place greater emphasis on imparting theoretical knowledge, while pupils are still uninterested in it. While in the practice session, I can be fully committed. Long-term theoretical ignorance and a lack of humanistic literacy lead to a lack of design thinking, an empty design language that can only be put together or imitated in graduation design, and subpar final design work. Furthermore, in the program design phase of the topic selection stage, the inadequacy of on-campus and off-campus practice platforms due to the cooperation of numerous universities and enterprises results in students having access to insufficient real project resources. Many students are forced to choose the direction of their graduation design based only on their interests, even in the case where a mentor is available to assist with the design process.

3. The Teaching Reform Approach of Graduate Design of Environmental Design Major Based on New Liberal Arts and Obe Concept

3.1 Clarify the Teaching Objectives of the Graduation Design Course

The core of the OBE concept is "student-centered" and "output-oriented," which dictate that educational institutions should explicitly state the course's nurturing objectives, rework expected outcomes and goals to take into account the unique circumstances of each student, and allow each student to choose a customized learning path within the classroom for them to grow and be productive. To enable every student to learn and be productive, they should find a personalized learning strategy that works for them. Four elements make up the environmental design graduate design course's educational goal: knowledge, ability, achievement and course design goals. These objectives are carried out through a variety of instructional strategies and techniques (Table 1).

Table 1: Setting of graduation project objectives

| | Target type | content | Implementation method |
|---|-------------------------|---|--|
| 1 | Course design objective | "Student-centered" | Using modern information teaching means, online teaching; The resource allocation of the campus teachers and practice platform is student-centered to ensure that every student can actively learn; Project teaching and "flipped classroom" teaching |
| 2 | Knowledge objective | Take "multidisciplinary knowledge learning" as the center | Taking the construction of university curriculum ideological and political projects as an opportunity, we should constantly strengthen the comprehensive study of humanities, architecture and materials science, focus on mastering the study of local regional culture and China's excellent traditional culture, build cultural confidence, and cultivate talents with broad vision of grand design concept |
| 3 | Capability objective | Cultivate interdisciplinary talents with broad vision and innovative thinking | Take innovative thinking and cross-border cooperation ability training as the core, break professional barriers, and seek cross-border cooperation; Taking the project as a link, introducing enterprises into education, industry elites into the classroom, and industry-university-research collaboration; Set up a studio, tutors with multi-disciplinary background, teachers and students choose from each other; Open class, students in small groups to discuss and report, with the goal of final results, constantly optimize the design content |
| 4 | Outcome objective | Oriented by design results and participation in competitions | At the beginning of the proposal, the final result is set and the task book is formulated. Teachers and students continue to work towards this result, and finally put the results into various competitions, and strive to win national and provincial awards |

3.2 According to the Results-oriented Planning of Graduation Design Topics

Under the OBE education idea, students' performance and outcomes should be carefully considered during the final course selection process to meet the course's learning objectives. Making a sensible plan for the ultimate course of action is crucial. The graduation topics can come from several sources. Examples of these include horizontal projects and scientific research topics for teacher guidance, the "real topic" in school-enterprise cooperation projects, the topic of the discipline competition track proposition, etc., all of which center on the challenges and hotspots of the industry today. For instance, the Ministry of Education's highly regarded "Future Designer-National Collegiate Digital Art Design Competition (NCDA)" held its "Million Dollar Prize" competition in March 2024, with the themes like "Yi Wu China Commodity City" and "Yi Wu International Commodity City." "Yi Wu China Commodity City" Cup International Commodity Creative Design Competition" is the competition's theme, and the proposals include "Intelligent Era Technology Appearance Hairdresser Creative Design," "Generation Z Autumn and Winter Wearing Armor Creativity and Its Packaging Design," and more. These competitions'

proposals can be taken up by educators and learners. To complement one other's team strengths and weaknesses, teachers and students can use these competitions as their graduation themes. Students can even choose their mentor based on their interests! The "student-centered" topic position will be fully utilized by the tutors, and the graduation design will methodically showcase their capacity to collaborate with others and feel creative. Together with other students, they will ultimately enter their designs into the competition for a chance to win awards. These project designs will also help them become more confident and capable in their practical abilities. When assigning topics to students, the tutor should take into account that each student has distinctive characteristics and varying talents. The tutor should also carefully consider the topic's theoretical underpinnings, practical applications, and viability before assigning it to ensure that the students will benefit from it.

3.3 Nurturing Interdisciplinary and Compound Talents through Multiple Channels

In the new era of the rapid development of the Internet and information technology, it is necessary to strengthen cooperation between various disciplines and majors. The industry and society urgently need large-scale design talents with cross-border thinking rather than specialized talents. For the design industry, cross-border cooperation is a phenomenon that designers will encounter in solving the problems of various design projects. For example, in the "Shanghai Design 100" Annual Outstanding Design Achievement Award held in 2022-2023, the "Ada·Modu" project, China's first large cruise ship, won this award. Its concept design, detailed design, artistic design and interior design mean the integration and innovation of product design, artistic design, experience design, etc. To some extent, whether graduates have cross-border cooperative thinking and comprehensive interdisciplinary ability is an important criterion for judging whether they can really enter the industry. For art design majors, interdisciplinary teaching can make students no longer limited to this professional knowledge, which is conducive for students to better diverge thinking, transform "knowledge" into "skills" and "practice" into "innovation ability" in an all-round way.

At present, design has developed into an interdisciplinary subject. In view of the strong practical characteristics of environmental design courses, the environmental design talent training model under the OBE concept should keep up with the forefront of the development of design, combine social hot issues, and integrate various resources with the help of multiple forces to realize the cross-border training of talents. At the same time, the proposal of the new liberal arts has put the multi-disciplinary interdisciplinary integration and cooperation, and the cultivation of interdisciplinary compound talents on the agenda. The cross-border integration of graduation design courses has become an inevitable trend of college reform. As early as 2009, Guangzhou Academy of Fine Arts, Central Academy of Fine Arts and Shanghai University Academy of Fine Arts tried to carry out the joint graduation design of the three universities, and carried out creative work design from different perspectives under the same research topic. In addition, the School of Design and Creativity of Tongji University, which is at the forefront of design, has invited tutors from all walks of life to join at the beginning of its establishment. Its mentor team not only has a background in design, but also has an educational background in computer information technology and mechanical design. Students can choose various projects led by their tutors according to their own interests, complete their own credits in cross-border cooperation projects and have a broad international vision, and then quickly solve problems in the face of various complex projects in the future.

In the graduation design major of environmental design, it is necessary to realize the integration between majors, disciplines and even cross-schools. First of all, in terms of the allocation of teaching teachers, the "double tutor system" should be implemented, so that on-campus tutors and off-campus industry tutors with practical experience can participate together. Tutors in the school should constantly strengthen their theoretical and practical guidance ability, and move towards the ability of "double teacher" teachers. At different stages of the graduation project, industry elites and interdisciplinary teachers are invited to enter the classroom to solve the interdisciplinary and cross-professional problems faced by students in different design stages. For example, the realization of the lamp design scheme not only needs to consider the design scheme itself, but also requires material professional tutors to guide material technology and environmental design tutors to create a light environment atmosphere arranged by lamps. Secondly, in the topic selection stage of the plan, the same theme can be selected for joint graduation design, focusing on conceptual design and solving hot problems in real life. Thirdly, in the stage of scheme design and production, multi-disciplinary and multi-professional cooperation is needed. Take the small architectural design in the topic of environmental design as an example. From the topic selection to design conception, to the real molding, it not only involves the appearance and function of the building, but also involves the content of other disciplines such as structural mechanics, materials science, environmental psychology, etc. Finally, in the graduation exhibition stage, it is necessary to

break the internal barriers of majors and departments of the school, take advantage of various majors and disciplines, and integrate different resources. Multi-professional cross-border and multi-college linkage exhibitions are also an important means to achieve cross-border cooperation. Take the final results of the project as a bridge to carry out cross-border joint exhibitions and realize the collision of creative design thinking.

3.4 School-enterprise Cooperation and Studio Collaborative Education

The graduation design of the environmental design major is a practice-based course. The implementation of the project plan is by no means a paper talk or a closed-door car. School-enterprise cooperation, studio model, and industry-university collaborative education can promote the sustainable development of both schools and enterprises, achieve resource sharing, mutual benefit and common progress, and achieve a win-win situation between universities and enterprises. On the one hand, colleges and universities can use the platforms and financial support of enterprises to invite industry mentors with rich practical experience to participate in the design guidance work together and establish studios, which is of great significance for universities to keep up with market demand, adjust teaching methods, cultivate students' innovative thinking, entrepreneurial awareness, industry work experience and even employment. On the other hand, enterprises can obtain the scientific research support of the school in school-enterprise cooperation, and use the high-quality resources of teachers and students to help solve the problems and research and development of enterprise projects. In addition, enterprises can also jointly formulate talent training plans with schools according to their own development needs to ensure that graduates have the ability and quality required for actual work and the adaptability of the workplace environment, and select high-quality graduates in cooperation to input innovative fresh blood for enterprise talents, and truly achieve mutual benefit and win-win results. The content of school-enterprise cooperation may include but is not limited to school-enterprise project consultation and cooperation, curriculum cooperation, joint studios, etc.

The studio model integrates teaching theory and practice, and is also an innovative practice platform for teachers and students to gather together in the same space environment and jointly complete some scientific research and project practice activities. Environmental design studios can publish project topics, "real topics" of enterprise projects, design themes of competition projects, etc., as graduation design topics, simulate the real design industry environment, guide students to cooperate independently, and help students improve their practical ability and employability in the process of constantly solving project design problems. The studio should reflect the OBE concept in teaching, attract outstanding students from different majors for multidisciplinary integration learning, give full play to students' subjective initiative, stimulate students' independent innovation spirit, integrate art design professional knowledge, professional skills and comprehensive quality of innovation and entrepreneurship, and truly achieve "student-centered", and Through the practice of graduation projects, high-quality design results are formed. By using the studio model, students can brainstorm and help students complete certain projects at different stages, so that students can see real learning results and their continuous progress. In the practice and communication of project practice, we can expand our horizons and learn knowledge to achieve the achievement goals under the OBE concept.

3.5 "Promoting Learning Through Competition" Feeds Back Theory and Future Career Planning

The combination of discipline competition and environmental design is an important way to realize the OBE result-oriented teaching concept, and also an important index to test students' design ability and practice level. At the beginning of the graduation design, preset what ability students should achieve and what results they need to complete, and reverse design the course, the key is to participating in the subject competition as a necessary requirement for graduation results. This requirement can effectively stimulate the competitiveness of students to win awards, so that students have a clear study and achieve the goal of graduation design. In order to achieve this goal, students need to cooperate with the team, take the initiative to understand the frontier direction of the discipline, and expand their knowledge. At the same time, the results of the competition can also feed back to the teaching and improve the problems in the teaching of graduation project. Through various competitions, students can not only obtain certain honors, but also pay attention to the cutting-edge information in the field of design during the competition, accumulate theoretical knowledge and practical level, and give play to their innovative spirit and teamwork spirit. Apply what you have learned in the curriculum system to the competition practice, a large number of practices made the competition project and theoretical knowledge concrete, and truly put what I learned into practice.

Under the background of national "double first-class" major construction, many colleges and universities in China have incorporated discipline competitions into regular teaching activities, and graduation design works have become the main source of award-winning works in various national and provincial discipline competitions because of their large size and high quality. For example, the "CHINA COLLEGLATE DESIGN COMPETITION & EXHIBITION", "China creative challenges contest", "National College Digital Art & Design Awards" and other competitions recognized by the Ministry of Education have become the first choice for environmental design students. The teachers and students of colleges and universities have achieved fruitful results in these competitions. Taking the environmental design major of Jingdezhen Ceramic University as an example, its students' graduation design works won more than 50 awards in the national and provincial competitions in 2023 alone, which also verified the empirical effect of the implementation of education reform from the side.

4. Conclusions

Xiaobo Lu, dean of the School of Fine Arts of Tsinghua University, said at the "New Era and New Arts: National Art Discipline Construction Seminar" in December 2020: "Design disciplines should improve the quality of educational talents in talent training, so as to be student-centred, strengthen general education, interdisciplinary training, and global competence, and focus on both theory and practice". The graduation design works condense the painstaking efforts of teachers and students, and are also the centralised presentation of the knowledge learned by students in the four years of college, which is the basis for students to go to the industry and society.

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