

INNOVATIVE TEACHING IN ENVIRONMENTAL DESIGN WITH A FOCUS ON "INTEGRATION OF THEORY AND PRACTICE, REALIZATION OF SITUATIONAL LEARNING" IN THE CONTEXT OF DIGITAL INFORMATIZATION

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Abstract: This paper investigates the innovative application of digital information technology in the environmental design profession, "the integration of science and reality, the realization of the context" teaching mode. With the rapid development of information technology, the application of digital informationization in the field of environmental design is becoming more and more extensive, which brings new opportunities and challenges for teaching. As an important base for cultivating environmental design talents, Guangdong Normal University of Technology has actively explored and implemented this teaching mode. Through the introduction of virtual reality (VR), augmented reality (AR), three-dimensional modeling and other advanced technologies, design theory and practical operation are closely integrated to effectively improve the level of informatization and the ability of students to apply digital technology. At the same time, the school has established a rich digital teaching resource library, using virtual teaching and research and hybrid teaching mode, realizing the organic combination of online and offline teaching. In addition, the school also pays attention to the application of contextual realization in environmental design teaching, through virtual space design, interdisciplinary workshops, school-enterprise cooperation and project practice, etc., to cultivate students' practical ability and innovation ability. This paper analyzes the teaching practice cases of Guangdong Normal University of Technology, summarizes the effectiveness of digital informatization teaching in the environmental design profession, and looks forward to the future development direction.

Keywords: Environmental design major; Digital informatization; Integration of science and practice; Contextual realization; Pedagogical innovation

1 INTRODUCTION

As a multidisciplinary and applied discipline, environmental design integrates the knowledge of art, architecture, material, environment and psychology, etc. With the rapid development of information technology, the application of digital information technology in environmental design has become more and more widespread, which brings new opportunities and challenges for environmental design teaching. With the rapid development of information technology, the application of digital informationization in environmental design is becoming more and more extensive, which brings new opportunities and challenges for environmental design teaching. As an important base for cultivating environmental design talents, Guangdong Normal University of Technology is actively exploring the teaching mode of digital informatization, which aims to improve students' informatization level and ability of digital technology application, and to cultivate professionals who can adapt to the needs of modern design industry.

2 AN OVERVIEW OF THE INTEGRATED TEACHING AND LEARNING MODEL

Integrated teaching of theory and practice is a teaching method that closely integrates theory and practice, which breaks the situation that theory and practice are separated from each other in traditional teaching. In this mode of teaching, the teaching process is relatively centralized [1]. In this teaching mode, the teaching process is relatively centralized, and both teachers and students teach, learn and do, promoting and improving each other. In the environmental design profession, the application of the integrated teaching mode can help students better understand and master the design theory, while improving their practical ability.

Guangdong Normal University of Technology actively implements the integrated teaching mode of science and practice in the environmental design program, which closely combines design theory and practical operation through the introduction of advanced digital technology and equipment, such as Virtual Reality (VR), Augmented Reality (AR), 3D modeling, etc. Students can not only learn design principles and methods, but also deepen their understanding and application of the theory through practical operation in the classroom. Students can not only learn design principles and methods in the classroom, but also deepen their understanding and application of theories through practical operation.

3 DIGITAL INFORMATICS IN THE TEACHING OF ENVIRONMENTAL DESIGN

3.1 The Creation of a Digital Teaching Resource Library

Guangdong Normal University of Technology has actively integrated high-quality teaching resources and established a rich digital teaching resource library. These resources include teaching courseware, case library, video tutorials and so on, covering all aspects of environmental design. Students can access these resources at any time through the online platform for independent and extended learning. At the same time, teachers can also utilize these resources for class preparation and teaching to improve the teaching effect.

3.2 Virtual Teaching and Learning and Hybrid Teaching Models

Guangdong Technical Normal University adopts virtual teaching and research and hybrid teaching mode, realizing the organic combination of online and offline teaching. Through virtual teaching and research, teachers can teach and communicate remotely, and students can learn anytime and anywhere [2]. At the same time, the school also introduced a hybrid teaching mode, combining online teaching and offline practice, so that students can master the theoretical knowledge, at the same time, practical operation and project practice.

3.3 Big Data Technologies in the Evaluation of Teaching and Learning

Guangdong University of Technology utilizes big data technology for teaching evaluation, which realizes comprehensive monitoring and analysis of students' learning process. By collecting students' learning data, teachers can understand students' learning progress, mastery and learning effect, so as to provide targeted guidance and adjustment [3]. At the same time, the school has also established a comprehensive teaching evaluation system, including student evaluation, teacher evaluation, peer evaluation and other aspects, to ensure that the quality of teaching and learning continues to improve.

4 CONTEXTUAL REALIZATION IN THE TEACHING OF ENVIRONMENTAL DESIGN

4.1 Virtual Space Design and Practice

The teaching of environmental design emphasizes the application of virtual space design and practice. By utilizing virtual reality technology, students can create their own virtual space for design and planning [4]. This teaching method not only breaks through the spatial limitation of traditional teaching, but also improves students' design ability and innovation ability. At the same time, students can also communicate and share through the virtual space to promote mutual learning and progress.

4.2 Interdisciplinary Workshops and Seminars

Through exchanges and cooperation with other disciplines, interdisciplinary workshops and seminars are actively organized to provide students with diversified learning opportunities. Students can broaden their horizons and ways of thinking and improve their problem-solving abilities. At the same time, workshops and seminars also provide students with practical opportunities to learn and grow by doing.

4.3 School-Enterprise Cooperation and Project Practice

By participating in actual projects of enterprises, we have established close cooperative relationships with many design enterprises and companies to provide students with internship and employment opportunities. Students can learn about the latest news and technology trends in the design industry and improve their practical ability and professionalism. Meanwhile, the school also carries out scientific research projects and teaching activities with enterprises to promote the integrated development of industry-university-research.

5 A CASE STUDY OF PEDAGOGICAL INNOVATION - THE TEACHING PRACTICE OF ENVIRONMENTAL DESIGN AT GUANGDONG UNIVERSITY OF TECHNOLOGY AND NORMALISM,

5.1 Integration of Digital Technologies with Environmental Design Courses

Guangdong Normal University of Technology actively integrates digital technology, such as three-dimensional modeling and virtual reality, into the environmental design courses. Through the application of these technologies, students can understand the design principles and methods more intuitively and improve their design ability and innovation [5]. At the same time, digital technology can also help students to carry out more accurate design calculations and simulation analysis to improve the accuracy and reliability of the design.

5.2 Hands-on Teaching with a Project-Driven Instructional Model that

We emphasize the application of practical teaching and project-driven teaching mode. By cooperating with enterprises to carry out actual projects, students can participate in the whole process of the project, from demand analysis, design planning to construction management and other aspects. This teaching method not only improves students' practical ability, but also lets them learn how to cooperate with team members, how to solve problems and other professional

qualities in practice [6].

5.3 Interdisciplinary Cooperation and Academic Exchanges

As shown in Figure 1, interdisciplinary cooperation and academic exchange activities are actively organized. Through exchanges and cooperation with other disciplines, students can understand the knowledge and technology trends in different fields and broaden their horizons and ways of thinking. At the same time, academic exchanges can also provide students with opportunities to show their achievements and promote mutual learning and progress.

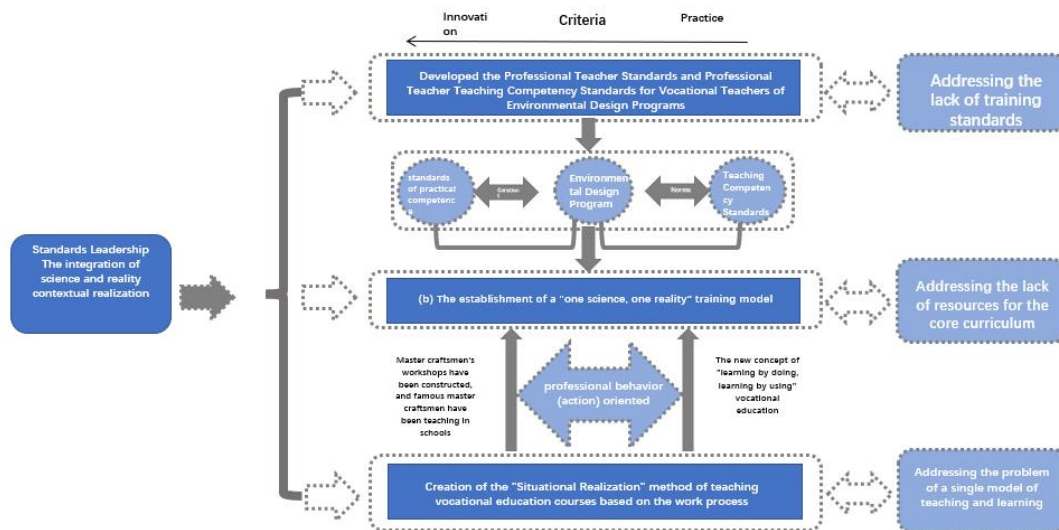


Figure 1 "Criteria Leadership, Integration of Science and Reality, and Contextual Realization" The Construction of Personnel Training System and Practice Training Mode of VET Teachers of Environmental Design Profession

6 IMPLEMENTATION PLAN AND METHODOLOGY OF "INTEGRATION OF SCIENCE AND REALITY, CONTEXTUAL REALIZATION" OF DIGITAL INFORMATIZATION

6.1 The Three-Dimensional Characterization of Digital Informatics Teaching and Learning

The process shows the three-dimensional characteristics of digital information technology integration teaching in environmental art design, aiming to stimulate students' learning interest and improve their professional skills through multi-dimensional technical means. Specific measures include.

6.1.1 BIM skills training

The introduction of BIM (Building Information Modeling) technology and professional skills training can significantly improve the practicality and relevance of teaching. This technology allows information to be visualized in three dimensions, closer to the real environment. Through BIM skills training, students can not only master advanced design modeling skills and construction management skills, but also enable them to better adapt to the development trend of information technology in the construction industry, laying a solid foundation for their future careers.

6.1.2 VR practical Training Workshop and VR Virtual Reality Training Room Construction

Through VR technology, building virtual reality training room and organizing workshop activities, students can practice and experiment in the virtual environment, can visualize the performance of their designs in the virtual space, make timely adjustments and optimize their designs. In addition, VR training workshop and virtual reality training room also provide a safe environment for students to learn how to deal with the challenges in the actual design scenarios without risk, and experience the design environment immersively, so as to improve students' spatial perception ability, enhance innovative thinking, and better understand and grasp the project teaching [7].

6.1.3 Online platforms and mobile applications

By using online learning platforms such as Study Pass, WeChat groups and various mobile APPs, teachers can effectively organize classroom teaching activities and link up all aspects of teaching. Students can access learning resources and participate in interactive discussions more conveniently. Through APP tools for daily classroom organization, task release, interactive Q&A, class management and grade management, etc., making teaching more convenient and efficient, realizing the seamless connection of online and offline teaching resources, and ensuring the coherence and completeness of teaching content.



Figure 2 Enterprise Participation in Curriculum Development

This figure 2 shows a practical case in which representatives of MARS Bright City Software participated in the construction of the course and explored the combination of the VR training room and the course, reflecting the specific application of digital informatization teaching in the environmental art design profession.

6.2 "Two-Teacher" Collaborative Education

In order to further improve the quality of teaching, we have adopted a "dual-teacher" approach to collaborative education, i.e., teachers from the school and mentors from enterprises participate in teaching together. Specific measures include.

6.2.1 Organization of short-term workshops

By cooperating with enterprises and organizing a large number of short-term workshops, we have incorporated the latest industry knowledge and practical experience into teaching, and actively promoted the reform of the environmental design major in terms of teaching materials, teaching methods and teaching staff. Students are guided by "dual-teachers" to carry out workshop activities, so as to gain valuable real experience.

6.2.2 Introducing part-time teachers

We invite a number of renowned designers in the field of environmental design as part-time teachers to supplement and enrich the content of the course, and ensure that students are exposed to cutting-edge knowledge and skills and broaden their academic horizons under the guidance of renowned teachers. At the same time, the design application and technology are both "science and practice as a whole", consolidating what they have learned in practice, and providing students with practical knowledge and theories that are close to the needs of the industry.

6.3 School-Enterprise Cooperation Feeds

In order to better adapt to the market demand and development trend, we have completed the construction of school-enterprise deep integration of BIM professional and technical training course system based on the concept of "one theory and one reality, realizing the situation", and constructed a three-dimensional evaluation system to promote the cultivation and training of composite technical and skilled personnel. Specific measures include.

6.3.1 Building a system of practical training courses

Closely focusing on the market demand, we have carried out in-depth cooperation and exchanges with a number of well-known enterprises, and developed the BIM professional and technical practical training course system [8]. Through this move to develop a set of teaching requirements and close to the market demand of the course system to ensure that the practicality and foresight of the BIM professional and technical training course system.

6.3.2 Building a three-dimensional evaluation system

In assessing students' learning outcomes, diversified evaluation methods are adopted to ensure the objectivity and comprehensiveness of the evaluation. Evaluation methods include enterprise evaluation, teacher evaluation, students' self-assessment and mutual evaluation, etc., in order to form a three-dimensional evaluation system and understand students' learning situation from multiple angles, so as to provide them with more accurate and personalized teaching guidance.

6.3.3 Training and certification of personnel in pilot enterprises

Since 2021, we have been actively responding to the needs of enterprises and accepting enterprise personnel to come for training and certification on a pilot basis. At the same time, it also provides a strong support and opportunity for our school to export professional talents to enterprises, realizes the feedback of school-enterprise cooperation to enterprises, and lays a solid foundation for the deep cooperation between our school and enterprises.

6.4 Market Demand Oriented

In order to better serve the local economic development and industry needs, we take the market demand as the guide,

build a digital information cooperation platform, improve the quality of talent training, and promote the employment of students. Specific measures include.

6.4.1 Building a platform for cooperation

Actively cooperate with schools, enterprises and other parties to build a digital information cooperation platform to promote information sharing, resource complementation and mutual benefit. With the power of the platform, it opens the way for professional services for local development.

6.4.2 Improving the quality of talent development

We actively adopt school-enterprise cooperation, industry-university-research combination and other ways to improve students' professional skills and comprehensive quality. At the same time, focusing on cultivating students' sense of innovation, encouraging students to actively participate in various project activities, and cultivating a group of high-quality talents with both solid professional knowledge and high comprehensive quality to meet the market demand and the needs of industry development.

6.4.3 Promoting student employment

We actively build a platform for employment services and provide students with a full range of employment guidance and career planning services. We provide students with the latest job information, job-seeking skills and career development advice, and offer personalized career guidance according to students' personal situation and career planning needs. We also provide personalized career guidance according to students' personal situation and career planning needs. We help students adapt to the market demand and employment environment, and successfully find employment.

6.4.4 Industrial development of the service sector

Provide multi-level talent support for the industrial development needs of the service industry. Through cooperation with enterprises to carry out personnel training, technical consulting and other service activities, to provide talent protection and technical support for industry enterprises; to solve technical development problems, and to promote the transformation and upgrading of the industry and sustainable development. Creative design workshop course content introduction can be seen in Figure 3.



Figure 3 Creative Design Workshop Course Content Introduction

The implementation plan and methodology of digital informatization, "integrating science and reality, realizing situation", covers many aspects, aiming at stimulating students' learning interest and improving their professional skills and comprehensive quality through multi-dimensional technical means and school-enterprise cooperation mode, so as to provide strong talent support for the local economic development and industry demand.

7 CONCLUSIONS AND PERSPECTIVES

The innovative research on the teaching of environmental design through digital informatization, "integrating science and reality, realizing context", has achieved remarkable results in Guangdong University of Technology and Normal Studies (GDUTNS). Through the introduction of advanced digital technology and equipment, the establishment of a rich digital teaching resource library, the adoption of virtual teaching and research and hybrid teaching mode, the university has effectively improved the quality and efficiency of teaching. At the same time, through practical teaching and project-driven teaching mode, interdisciplinary cooperation and academic exchanges and other activities, the university has cultivated students' practical and innovative abilities.

In the future, Guangdong Normal University of Technology will continue to deepen the teaching reform of digital informatization and explore more efficient and innovative teaching modes and methods through "integrating science and reality, realizing context". At the same time, the university will also strengthen the contact and cooperation with enterprises and the society, promote the integrated development of industry-university-research, and cultivate more high-quality environmental design talents with interdisciplinary vision and innovation ability for the society.

COMPETING INTERESTS

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