Strategies for the Development and Application of Digital Teaching Resources in Vocational Bachelor's Environmental Art Design Program

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Abstract: This paper aligns with the characteristics of vocational bachelor's education and the digital development trend of the Environmental Art Design industry to deeply analyze the core pain points in the development and application of digital teaching resources, and explore targeted development pathways and application strategies, aiming to optimize teaching resource distribution, promote the reform in teaching models, enhance the professional teaching quality, facilitate students' precision alignment with job requirements, and achieve the connotative development of vocational bachelor's Environmental Art Design program.

Keywords: Vocational Bachelor's Education; Environmental Art Design; Digital Teaching Resources; Development Strategies; Applied Pathways

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1.Introduction

With the deep penetration of digital technology in the Environmental Art Design industry, the industry's requirements have been continuously increasing for the digital skills of practitioners. Traditional hand-drawn design and two-dimensional modeling have gradually been replaced by three-dimensional visualization, virtual simulation, parametric design, and other digital methods. Vocational bachelor's Environmental Art Design program serves as a crucial bound bridging higher education and industry employment, and it bears the significant mission of cultivating applied design talents. It is imperative to integrate digital teaching into the entire process of talent cultivation. As the cornerstone for implementing digital teaching, the scientific rigor, practical efficacy, and targeted relevance of digital teaching resources directly determine the attainment of learning objectives. However, currently, in most vocational undergraduate institutions, the development of digital teaching resources for Environmental Art Design still follows the regular bachelor's teaching models, lacking precision alignment with vocational competencies. During the application process, there are a phenomenon of "emphasis on resource construction over utilization, and formalistic approaches over substantive outcomes", failing to adequately leverage the educational value of digital resources.

2.Core Challenges in the Development and Application of Digital Teaching Resources in Vocational Bachelor's Environmental Art Design Program

2.1 *Resource Homogenization and Critical Position-Specific Deficiency*

Currently, certain vocational undergraduate institutions suffer from digital teaching resource homogenization in Environmental Art Design program. They often draw upon the resource construction models of regular undergraduate colleges, failing to ground themselves in vocational bachelor's typological distinctiveness and disciplinary characteristics. The resource content mainly focuses on the digitalization of theoretical knowledge, concentrates on fundamental content, such as design software operation tutorials, and classic case showcase, and lacks precision analysis of the positions in the Environmental Art Design industry, failing to integrate the core job skills, such as construction technology, scheme implementation, and cost control, into the resource development process. Meanwhile, during the process of resource development, there is a lack of enterprise engagement, failing to absorb the latest digital design technologies, design norms and project experience in the industry. This results in a disconnection between the resource content and the industry demands, struggling to meet the requirements for students' vocational competency cultivation and failing to reflect the core orientation of vocational undergraduate education— "application-oriented" [1].

2.2 *Monolithic Resource Types and Insufficient Resource Alignment*

The types of digital teaching resources are relatively limited, mainly consisting of traditional digital resources such as video tutorials, electronic courseware, and online exercises, and lacking interactive, practical, and immersive resource types. Environmental Art Design program gives priority to spatial perception, creative expressions and practical operation. However, current digital resources are mostly the unidirectional output type, leaving students merely receiving knowledge passively, and struggling to engage in interactive experience, failing to effectively cultivate their spatial imagination and creative design capabilities [2]. Furthermore, some digital resources fail to align with the teaching equipment and teaching models of vocational undergraduate institutions. Some complex virtual simulation resources and 3D modeling resources require support from high-end teaching equipment. However, some vocational undergraduate institutions are constrained by their budget and fail to meet the hardware requirements for resource application, resulting in the inability of some high-quality digital resources to realize their actual utility.

2.3 *Formalistic Resource Application, Failing to Leverage Their Efficacy*

In most vocational bachelor's Environmental Art Design program, the application of digital teaching resources remains at primary stage, failing to integrate deeply with professional teaching and practice teaching. Some teachers still continue to use the traditional teaching model, regard digital resources merely as auxiliary tools for classroom demonstrations or as post-class supplements, and fail to integrate digital resources into the entire process across learning objectives, teaching procedures, and teaching evaluations, resulting in formalistic application of resources. Meanwhile, the digital teaching competencies of some teachers are insufficient. They lack the awareness and capability to carry out teaching reform and innovate teaching models by using digital resources, failing to proficiently use digital resources to design interactive, inquiry-based, and project-based teaching activities. As a result, they are unable to fully leverage the educational efficacy of digital resources [3]. Furthermore, students' initiative is insufficient in digital learning. Most students merely utilize digital resources to complete their homework and review for exams, and fail to proactively utilize digital resources for self-directed learning, creative practice, and improvement of vocational competencies, which further restricts the efficacy of resource application.

2.4 *Undeveloped Resource Safeguard Systems, Impeding Sustainable Development*

The development and application of digital teaching resources lack a sound safeguard system, mainly manifested in three aspects: funds, faculty, and management. Insufficient funding is a significant factor restricting the development and application of resources. Some vocational undergraduate institutions attach insufficient importance to the construction of digital teaching resources in the Environmental Art Design program, and invest limited funding in it, failing to support the development, update and maintenance of high-quality digital resources, resulting in outdated and low-quality resource content. The development of teaching faculty lags behind, with a shortage of interdisciplinary teachers who possess integrated digital competencies, professional expertise, and teaching competencies. Most teachers mainly rely on short-term training to improve their digital skills, lacking systematic cultivation and practice, failing to meet the demands for the development and application of digital teaching resources. The resource management mechanism is not perfect, lacking a dedicated resource management team and management system. The classification, storage, update and sharing mechanisms of digital resources are not sound, resulting in disorderly and redundant construction of resources, failing to achieve efficient utilization and sustainable renewal of resources [4].

3.Development Strategies for Digital Teaching Resources in Vocational Bachelor's Environmental Art Design Program

3.1 *Anchoring Typological Distinctiveness, and Precisely Aligning with Job Requirements*

The development of digital teaching resources should be grounded in the typological distinctiveness of vocational bachelor's environment art design program, and oriented by job requirements in the industry to precisely

analyze the core job skills, and build a highly targeted, and highly practical digital teaching resource system. Firstly, vocational undergraduate institutions should conduct industry research to gain a deep understanding of the development trends, position setup and skill requirements of the Environmental Art Design industry, clearly define the core skills for different positions such as interior design, landscape design, and public space design, integrate the job skills of construction technology, scheme design, 3D modeling, rendering of effect drawings, and cost control into the resource development process to ensure that the resource content is highly aligned with the job requirements [5]. Secondly, they should strengthen cooperation with enterprises, invite front-line designers and technical experts from the enterprises to engage in the development of digital teaching resources, incorporate authentic enterprise projects, design cases, and industry standards into the resource construction process to enhance the practical applicability and real-world utility of the resources, enabling students to gain exposure to the industry reality during their learning and cultivate their position-specific capabilities. Finally, they should highlight the typological DNA of vocational bachelor's education, lay emphasis on the real-world utility and practical applicability of resources, reduce the proportion of purely theoretical resources, increase practical, project-based, and skill-related resources, and prioritize developing resources that can cultivate students' creative design capabilities, practical competencies, and digital application capabilities.

3.2 *Expanding the Resource Types, and Enhancing the Resource Alignment*

Vocational undergraduate institutions should account for the teaching characteristics of the Environmental Art Design program and the cognitive laws of students to enrich the types of digital teaching resources and construct a diversified, interactive and immersive digital teaching resource system. Firstly, they should develop practical resources, leverage digital technology to develop 3D modeling cases, tutorials for rendering of effect drawings, construction technology simulation videos, etc., aiming to guide students to conduct hands-on operation and enhance their practical competencies, and develop project-based teaching resources based on authentic industry projects to enable students to conduct creative design, scheme optimization, and scheme implementation around authentic projects, thereby cultivating their project handling capabilities. Secondly, they should develop interactive resources, utilize technologies such as virtual reality and augmented reality to develop virtual simulation-based teaching resources, build virtual design space and virtual construction scenarios, enabling students to fully immerse themselves in the entire process of design and construction, thereby enhancing their spatial perception and creative expression capabilities, and develop interactive exercises, online Q&A, and creative communication platforms to promote interaction between teachers and students, as well as among students themselves, and ignite students' proactive learning. Thirdly, they should optimize resource alignment, develop multi-layered digital resources based on the teaching equipment and teaching models in vocational undergraduate institutions to ensure that the resources can align with the existing teaching equipment and meet the learning needs of students at different level, and simplify the operation procedures of some complex resources to enhance their usability, so that teachers and students can conveniently use the digital resources.

3.3 *Upholding Industry-Education Integration, and Facilitating Co-Construction and Sharing of Resources*

The development of digital teaching resources in vocational bachelor's Environmental Art Design program should uphold industry-education integration, as well as university-enterprise collaboration, promote the co-construction and sharing of resources, and improve the quality and utilization efficiency of the resources. On the one hand, vocational undergraduate institutions should deepen university-enterprise collaboration, establish long-term and stable partnerships with Environmental Art Design companies and design studios to jointly build digital teaching resource libraries. Enterprises provide authentic project cases, industrial technical standards, design software resources, etc., while universities offer teaching philosophy, teaching teams, teaching venues, etc. Together, they develop digital teaching resources that meet both teaching needs and industry demands, achieving complementary resources between schools and enterprises. On the other hand, they should promote co-construction

and sharing of resources among universities, strengthen cooperation with other vocational undergraduate institutions in Environmental Art Design, integrate high-quality digital teaching resources, establish regional digital resource sharing platforms, dismantle the resource barriers among universities, achieve efficient utilization of resources, reduce redundant construction, and lower the cost of resource development. Concurrently, they should encourage teachers and students to engage in the construction of resources, guide teachers to develop personalized and distinctive digital teaching resources based on their own teaching experience and research achievements, and encourage students to transform their creative design works and practice achievements into digital teaching resources to enrich the resource content and enhance the innovativeness and real-world utility.

4.Strategies for the Application of Digital Teaching Resources in Vocational Bachelor's Environmental Art Design Program

4.1 *Integrating the Resources into the Whole Teaching Process, and Innovating Teaching Models*

Vocational undergraduate institutions should integrate digital teaching resources deeply into the entire process of professional teaching, break through the limitations of traditional teaching models, and construct a digital, project-based, and interactive teaching model. In theory teaching activities, they should leverage digital resources, such as electronic courseware, video tutorials, and online case studies, to convert abstract design theories and principles into vivid and understandable content, thereby facilitating students to comprehend and master the knowledge, and use interactive resources to implement inquiry-based teaching and discussion method, and encourage students to think and communicate proactively, thereby igniting their interest in learning. In the practice teaching activities, they should rely on virtual simulation resources and project-based resources to carry out project-driven teaching to provide students with authentic projects, and enable students to conduct creative design, scheme optimization, construction simulation and other practical activities by leveraging digital design software and virtual simulation platforms, thereby enhancing their practical competencies and project handling capabilities, and utilize digital resources to implement stratified teaching, feeding tiered resources to students according to their learning capabilities and skill level to meet the learning needs of students at different level. In post-class extension activities, they should leverage online learning platforms and digital resource libraries to guide students in self-directed learning and skill enhancement and encourage students to conduct creative practice and innovation/entrepreneurship training using digital resources, thereby extending the teaching chain and elevating students' holistic competencies.

4.2 *Elevating Faculty Competence, and Fortifying Applied Proficiency*

Teachers are the core entities in the application of digital teaching resources, and enhancing teachers' digital teaching capabilities is the key to maximizing the efficacy of resource utilization. On the one hand, vocational undergraduate institutions should establish a systematic faculty training system, regularly organize teachers to participate in digital teaching skills training and industry technology training, focusing on training the application of digital design software, virtual simulation technology, and online teaching platforms to enhance teachers' digital operation capabilities, and invite industry experts and outstanding digital teachers to give special lectures and teaching demonstration classes in order to share their digital teaching experience and application skills of resources, and guide teachers to update their teaching philosophy and improve their digital teaching design capabilities. On the other hand, they should establish practical training platforms for teachers, encourage them to engage in practical training in enterprises, participate in the design of authentic enterprise projects, understand the latest digital technologies and their application trends in the industry in order to integrate industry experience into digital teaching, and organize teachers to carry out activities, such as research on digital teaching reform projects and teaching case discussions to promote communication and cooperation among teachers, and enhance their digital teaching innovation capabilities.

4.3 *Strengthening Student Guidance, and Igniting Learner Agency*

Vocational undergraduate institutions should place emphasis on guiding students, ignite learner agency, and enable them to proactively utilize digital teaching resources to enhance their own capabilities. On the one hand, they should enhance digital learning education, and guide students to recognize the significance of digital skills in the Environmental Art Design industry, establish the concept of digital learning, clearly define the objectives of digital learning, and ignite students' initiative and self-consciousness in learning. On the other hand, they should innovate learning evaluation methods, including students' use of digital resources and mastery of digital skills, and creative practice outcomes in the learning evaluation system, transcend the traditional monolithic evaluation models, adopt a combination of process-oriented evaluation and summative evaluation to comprehensively assess students' learning outcomes, and guide them to proactively utilize digital resources for self-directed learning and creative practice.

4.4 *Refining the Safeguard Systems, and Advancing Sustainable Application*

Vocational undergraduate institutions should refine the safeguard systems for the development and application of digital teaching resources, providing strong support for the sustainable application of these resources. The first is to increase investment, place more emphasis on the construction of digital teaching resources, and reasonably allocate funds for the development, update, maintenance of high-quality digital resources, as well as the upgrade and renovation of teaching equipment to ensure that the hardware equipment meet the requirements of resource application. The second is to improve the mechanism for faculty team construction, engage versatile teachers who possess digital skills, professional expertise, and teaching competencies, strengthen the digital training and practical training for the existing teachers, and build a high-quality faculty team for digital teaching. The third is to perfect the resource management mechanism, establish a dedicated resource management team, which is responsible for classifying, storing, updating, sharing and maintaining digital resources, formulate a comprehensive resource management system, standardize the process of resource construction and application to avoid redundant resource construction and disorderliness, and ensure the efficient utilization and sustainable renewal of resources, establish a resource renewal mechanism, promptly incorporate the latest technologies, design cases and industry norms in the industry, and update the resource content regularly to ensure the timeliness and real-world utility of the resources.

5.Conclusion

The development and application of digital teaching resources in vocational bachelor's Environmental Art Design program is an important measure to promote professional teaching reform, enhance the quality of talent cultivation, and meet the industry development requirements. Currently, the development and application of digital teaching resources in this field still suffer from serious challenges, such as severe homogenization, monolithic resource types, superficial application, and imperfect safeguard systems, impeding the further advancement of digital teaching. To address these challenges, it is necessary to, grounded in the typological distinctiveness of vocational bachelor's education, and oriented by the job requirements, uphold industry-education integration, and university-enterprise synergy, methodically develop position-specific, operationally deployable, and diversified typology digital learning resources, deeply integrate the digital resources into the whole teaching process, innovate teaching models, enhance teachers' digital teaching competencies, augment scaffolded learning guidance, refine the safeguard systems, and adequately exert the educational efficacy of digital resources.

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