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Developing a Teaching Model Based on A Simulation Company in Order to Improve the Working Ability of Environmental Design Students in Xinxiang City, Henan Province, China

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ABSTRACT

This study aims to analyze the current state of environmental design education in Xinxiang City, Henan Province, China, and to develop and evaluate a teaching strategy based on a simulated company teaching model to enhance students' work capabilities. The research process is divided into three phases: current situation investigation and analysis, model development, and model evaluation. The subjects of the study are undergraduate students majoring in Environmental Design from five universities in Xinxiang City, Henan Province, China. This study employs a mixed-methods approach, combining literature review, questionnaire surveys, semi-structured interviews, and focus group discussions. The research follows six steps: identifying problems, locating key teaching points, developing a teaching model, collecting feedback, optimizing the model design, and determining the final version of the model. Data collection methods include interviews, questionnaire surveys, observations, and practical assessments. Data analysis was conducted using SPSS software, encompassing descriptive statistics, mean values, percentages, reliability, and standard deviation calculations. The study found that there are difficulties in recruiting for enterprises and difficulties for students in finding employment in the field of environmental design in Xinxiang City. Additionally, there is a disconnection between the current curriculum settings and the needs of enterprises, which fails to meet the demands of the industry. Therefore, it is urgent to develop a teaching model that meets the needs of enterprises and enhances students' work capabilities. The developed simulated company teaching model was ultimately confirmed to be appropriate and feasible after expert evaluation and feedback from focus groups. The research results highlight the potential and value of the simulated company teaching model in improving the work capabilities of students majoring in environmental design.

Keywords: Teaching Model, Environmental Design, Simulated Company

INTRODUCTION

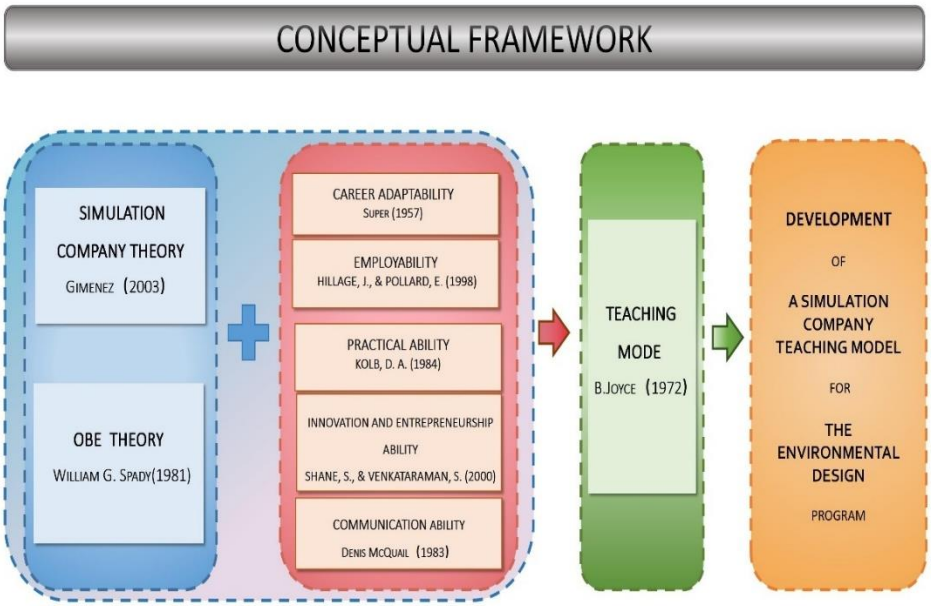
The employment and unemployment challenges facing youth and college students have become a pressing global issue. The International Labour Organization (ILO) predicted in its *World Employment and Social Outlook: Trends 2024* report that global unemployment would rise to 5.2% in 2024, with an additional 2 million job seekers entering the market. Declining disposable incomes and persistent inflation have further worsened living standards worldwide. We are now navigating the BANI era—an environment that is brittle, anxious, non-linear, and incomprehensible—marked by unpredictability, rapid technological change, and weakened traditional development patterns. These shifts have led to major changes in employment structures and social dynamics, where individuals can no longer passively respond but must proactively adapt to evolving conditions. In China,

the rise in higher education has led to a surge in college graduates, reaching 11.58 million nationwide in 2023. Henan Province, the country's most populous, produced 870,000 graduates, with Xinxiang City alone accounting for over 57,000. Despite this growth, many graduates are unwilling to remain in Henan for employment, contributing to a significant talent outflow. The employment pressure is particularly acute for disciplines tied to vulnerable industries. For instance, the environmental design major—once popular—now faces reduced enrollment and employment prospects due to the real estate industry downturn and shrinking demand for design services. Graduates in this field often struggle with a disconnect between academic training and workplace needs, lacking both practical experience and industry-aligned skills. This mismatch results in poor employment quality and unmet employer expectations, as companies rarely afford the time or resources to onboard inexperienced graduates. The situation highlights the need for universities to reform curriculum design, emphasizing practical training, interdisciplinary knowledge, and innovation. The challenges faced by environmental design students reflect broader systemic issues: outdated education models, lack of experiential learning, and insufficient collaboration between academia and industry. Addressing these employment challenges requires coordinated efforts from governments, educational institutions, and the private sector. Initiatives must include enhanced pre-employment training, internship programs, and entrepreneurial support systems. Flexible employment policies and mechanisms that adapt to market shifts are also essential. Ultimately, improving graduate employability depends on aligning education with industry demands, fostering innovation, and equipping students with the resilience and adaptability required to thrive in an unpredictable global job market.

Research Objectives

1. To study the state and problem of environmental design major in Xinxiang, Henan, China
2. To develop a teaching model of environmental design for capacity building for a university in Xinxiang, Henan Province, China.
3. To Confirm the curriculum of environmental design to enhance competency for the university in Xinxiang, Henan, China.

Conceptual Framework



Comparison of the Development of Teaching Environmental Design Majors in China and Foreign Countries

The researcher mainly through the Italy, the United Kingdom, the United States, China, four countries, a comparative study, as shown in Table 5. Through the various dimensions, analysis of different national conditions to start, all levels of comparison, can be deeper to understand China's existing teaching and curriculum awareness, compare the similarities and differences, and analyze the reasons for this, in order to obtain new ideas and thoughts and summaries.

Table 1: The status quo and comparative analysis of the development of the teaching of foreign environmental design disciplines (author's own drawing)

Analysis of the current situation of teaching development of environmental design majors in 4 countries			**Analysis of commonalities and differences in the teaching development of environmental design majors in 4 countries**	
country	**specialized field**	**Current status of pedagogical development**	**Commonality**	**Differences**
Italy	Interior Design	Close integration with the market and cooperation with enterprises; requiring familiarity with the regulations of the design industry; comprehensively equipped with integrated practical training courses; conducting integrated workshops and interdisciplinary workshops; encouraging students to participate in projects in a teamwork manner; emphasizing the application of technology; focusing on handicrafts and traditional crafts.	1. Environmental design education in all countries emphasizes the combination of practice and theory. 2. Interdisciplinary learning is a common trend in design education in all countries. 3. Technical applications, such as CAD and 3D modeling, play an important role in design education in all countries. 4. Cultivation of innovation ability is the focus of education in all countries. 5. Industry cooperation is a common feature of design education in all countries.	1. Differences in the structure of the education system, cultural influences, industry regulations. 2. Differences in educational accreditation, teacher qualifications and student competency development. 3. China and Italy emphasize more on the integration of traditional culture and handicrafts. 4. The U.S. and U.K. education systems are more flexible, emphasizing social needs and student development. 5. The U.S. has a mature accreditation system, while the accreditation systems of other countries may not be as mature as that of the U.S.
United States	Art Design	The government supports and emphasizes the development of the design industry, the needs of society and the development of students; emphasizes interdisciplinarity; and the education system and the industry work together to designate and raise the standards of the curriculum as well as to participate in the training of students. Introducing "dual-teacher" teachers; emphasizing the application of technology; entering a multi-dimensional perspective in the pre-design stage; emphasizing students' active learning; developing communication ability.		
UK	Interior Design	Social demand is an important driving force; focus on the relationship between curriculum and training objectives; improvement of curriculum standards by the education system and industry; integration of interdisciplinary curricula; emphasis on technology application; joint participation in industry mentoring; combination of education and practice standards.		
China	Environmental Design	Emphasis on integration of traditional culture; emphasis on multidisciplinary intersection; emphasis on practice-oriented; emphasis on sustainable design; emphasis on technology application; is exploring cooperation with enterprises; at present, China's environmental design standards need to be improved urgently.		

Practical Research on Teaching Model of Simulated Company

The researcher provides the main viewpoints of different scholars on the researcher provides the main viewpoints of different scholars on communication competence, different research perspectives. As shown in Table 2:

Table 2: Different scholars' views on communication ability (organized by the authors)

Research Perspectives	**Scholars**	**Main points of view**
The use of simulation companies in advertising education	Chongying (2010)	Through simulated company practice, advertising students are able to gain experience in combining theory and practice.
Practice Teaching Mode in American Colleges and Universities	Zhao Minggang (2011)	A variety of practice teaching models in American colleges and universities are analyzed, including internships and case center teaching.
The role of simulation company model teaching system in the art and design program	Huang, Er (2009)	It discusses how the simulation company model can improve students' teamwork ability and innovation ability.
The implementation program of teaching method of simulation company	Tian, Yingcui et al (2011)	The specific implementation plan of the simulated company teaching method is proposed, emphasizing the cultivation of professionalism and practical ability.
The role of simulation company technology in the development of management ability	Kenneth and Dallas (1992)	The importance of OrgSim in enhancing the competencies of managers and future leaders is discussed.
The role of experiential learning in leadership development	Scott and Jing Luo (2012)	How Greenwich Business School develops student leadership through experiential learning is explored.
Differences between simulation case study approach and traditional classroom learning approach	Richard and Martin (2010)	An experimental study compares the effectiveness of a simulated case study approach to traditional classroom learning.

The application of simulation companies in advertising education	Yi, Chongying (2010)	By practicing in a simulated company, advertising students are able to gain experience in combining theory and practice.

In summary, simulation company, as a talent cultivation mode under the guidance of theoretical ideas and based on the needs of practice, has been paid attention to in practice and academia, but there is less research on simulation company in the current environmental design professional academia. The simulation company model provides a new perspective for environmental design education research, emphasizing the exploration and research on the path of students' ability improvement. Through in-depth research on the practice of simulation company, we can find its great potential in the teaching of environmental design majors. The simulated company model not only provides a simulated workplace environment that allows students to apply theoretical knowledge in practice, but also promotes the overall enhancement of students' professional abilities. The implementation of this model, combined with the specific needs of the environmental design profession, allows for the development of new teaching models that will help to improve students' academic work abilities. Simulation company as a teaching model, its biggest difference with other models such as clubs and internships is that it can provide students with a simulated workplace environment in which students can play real workplace roles for a long period of time and continuously; in the unique artificially-created environment of the simulation company, how do students achieve the enhancement of their vocational ability, what are the conditioning factors and catalysts that influence and catalyze them, as well as how do they influence their long-term vocational In the unique environment of the simulation company, how students realize their professional ability improvement, what condition factors influence and catalyze them, and how it affects their long-term career growth and career, etc., are worthy of further exploration and research, and the black box of students' ability improvement and professional growth in the environment of the simulation company should be opened, so as to better utilize the role and value of the simulation company in the training of talents. The simulation company model has had a profound impact on the teaching model of environmental design majors, which not only improves students' practical ability and career adaptability, but also provides new ideas and methods for educational research and teaching practice. The following research can further explore the application of the simulated company model in environmental design education and how this model can be optimized to better develop students' professional competence.

RESEARCH METHODOLOGY

This study employs a mixed-methods approach, incorporating both quantitative and qualitative research methodologies to comprehensively analyze the current state of environmental design education in Xinxiang City, Henan Province, China. The study is structured into three phases:

1. ***Phase 1:*** Analysis of Research Status and Identification of Problems. In this initial phase, a comprehensive investigation of the current state and challenges of environmental design education in Xinxiang City is carried out. This phase includes a literature review, questionnaire surveys, and expert interviews to gather both quantitative and qualitative data. The goal is to gain a thorough understanding of the existing educational framework, pinpoint key issues, and create an empirical foundation for developing a new teaching model.
2. ***Phase 2:*** Development of the Teaching Model. Building on the findings from the first phase, a student-centered teaching model will be crafted, incorporating the concept of an "Environmental Design Simulation Company." This model seeks to enhance students' practical skills by mimicking real-world professional environments. Pedagogical and design theories will be integrated to develop an innovative educational framework tailored for environmental design students in colleges and universities in Xinxiang City.
3. ***Phase 3:*** Evaluation and Optimization of the Teaching Model. The final phase emphasizes assessing the effectiveness of the developed teaching model through feedback from key stakeholders, including educators, industry experts, and design practitioners. Focus group discussions will be conducted to evaluate the model's feasibility, adaptability, and practicality. Based on this feedback, necessary modifications will be made to optimize the model for real-world application in environmental design education.

A purposive sampling method will be employed to choose participants from various stakeholder groups to ensure a well-rounded understanding of the research topic. The study will involve: Environmental Design Students: A sample of 1,457 students across four undergraduate years from five colleges and universities in Xinxiang, Henan Province. Design Firm Managers: Three managers from environmental design firms in Xinxiang, selected for their expertise and industry experience. Well-Known Designers: Three distinguished designers from Xinxiang with notable achievements in the field. Environmental Design Education Professionals: Four experts, including

educational directors, supervisors, school administrators, department heads, and specialized course instructors from universities in Xinxiang.

The study will utilize multiple research instruments for data collection and analysis: 1. Questionnaires – Distributed among environmental design students to assess their perceptions of existing educational practices and the new teaching model. 2. Focus Groups – Conducted with educators, industry experts, and designers to evaluate the developed model's effectiveness.

Data Analysis Techniques. To ensure the rigor and reliability of the study, the following statistical and analytical techniques will be applied: Krejcie & Morgan Sampling Method – Used to determine the appropriate sample size. PNI (Priority Needs Index) – Applied to identify gaps and prioritize educational improvements. Descriptive Statistics – Including mean, percentage, and standard deviation to summarize data trends. Bartlett's Test of Sphericity – Employed to assess data suitability for factor analysis. Instrument Reliability Testing – Using Cronbach's Alpha Coefficient and Item-Objective Congruence (IOC) to validate the reliability and consistency of research instruments.

This methodological approach ensures a systematic, empirical, and data-driven assessment of environmental design education in Xinxiang, leading to the development and refinement of an effective teaching model.

RESULTS

Phase I: Analysis of the Current Situation and Problems of Environmental Design Specialties.

The analysis of the survey data of the environmental design students reveals several key issues: students' insufficient knowledge of the industry development trend; despite their high demand for professional skills and creative practice ability, they relatively lack understanding of the overall development trend of the industry and market insight, which indicates that the current curriculum may be insufficient in terms of educational content on industry dynamics and market demand analysis, leading to students' Insufficient clarity on the direction of future career development; Insufficient practical ability and internship experience: students generally believe that insufficient internship experience and the urgent need to improve their practical ability is one of the main challenges they face in the process of employment, which indicates that the practicality of the current curriculum still needs to be strengthened, and that the students' adaptability in the real work environment needs to be further improved; The course content needs to be further aligned with the employment: although students have a high level of acceptance of the course content, it is not clear that the course content has a high level of acceptance. course content is highly recognised, they hope that the courses can be more closely aligned with the actual work demands, especially to enhance the practicality of the courses. There is still a certain disconnect between the teaching content and the actual needs of the industry; the need to strengthen career development guidance and employment competitiveness cultivation: the survey shows that students' demand for career development guidance and employment competitiveness enhancement courses is higher, which means that the current teaching support related to career planning still needs to be strengthened; there is still room for students to improve their teamwork and communication skills: students are more concerned about the teamwork session, and they hope to get more teacher feedback and guidance. This indicates that there is still a need for them to improve their teamwork and communication skills, especially in dealing with team conflicts and collaborative tasks.

In view of the above problems, we can try to improve the direction: enhance the content of the course on industry trends, market analysis and cutting-edge technology: through lectures by industry experts and cooperative courses with enterprises, students can gain a deeper understanding of the current situation and future development of the industry. Increase opportunities for school-enterprise co-operation and introduce real projects as practical content in the curriculum: Strengthen innovative teaching modes such as 'simulated company', so that students can gain practical experience close to real work while they are still in school. Promote more internship opportunities in the industry and encourage students to participate in corporate internships during their school years. Introducing more real cases in the industry to improve the practicality of the courses: inviting experts from enterprises to participate in the design of the courses to ensure that the teaching content matches the needs of the industry. Adopting the project-based teaching mode, allowing students to have direct contact with industry needs during the course. Add career planning courses to help students clarify their career development paths: organise vocational skills training, such as interviewing skills, CV writing and personal brand building. Promote a career mentorship system whereby industry practitioners or alumni provide career guidance. Strengthen students' teamwork skills through projects and workshops: provide specialised training in team management and interdisciplinary collaboration to improve students' team communication and leadership skills. Encourage students to participate in inter-professional and interdisciplinary collaborative projects to foster teamwork.

Phase 2: Development of a Teaching Model based on a Simulated Company Teaching Model Design (Draft)

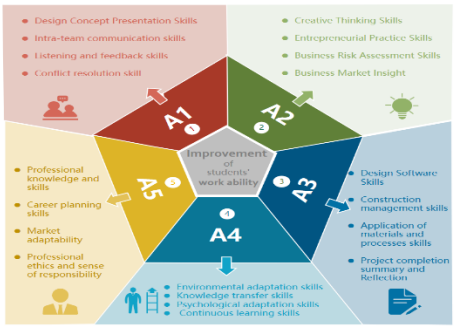


Figure 1: Model diagram(draft) of the work competencies that environmental design students need to enhance

The above diagram displays the specific model for enhancing students' work capabilities as follows:

A1 - Communication Ability: Includes design concept expression, intra-team communication, conflict resolution, listening, and feedback skills. These skills are crucial for students to effectively communicate and collaborate in a team setting.

A2 - Innovation and Entrepreneurship Ability: Covers innovative thinking, entrepreneurial practice skills, business risk assessment, and market insight. These abilities help students think and act creatively when facing new opportunities.

A3 - Practical Ability: Includes knowledge of design software, construction management, material and process application, project completion summary, and reflection. These skills enable students to apply theoretical knowledge in practical work and learn from experience.

A4 -Career Adaptability: Includes environmental adaptation, knowledge transfer, psychological adaptation, continuous learning, career planning, market adaptation, professional ethics, and sense of responsibility. These capabilities help students adapt to a constantly changing work environment and plan and manage their careers.

A5 -EmployabilityIt: Includes professional knowledge and skills, career planning, market adaptability, and professional ethics and sense of responsibility. These abilities help students demonstrate their qualifications during job seeking, plan career development, adapt to market demands, and exhibit professionalism and responsibility at work.

This model provides a structured approach to developing key capabilities for environmental design students. 1. Communication Ability: Enhances design concept expression, conflict resolution, active listening, and intra-team communication to improve collaboration and idea presentation. 2. Innovation & Entrepreneurship: Develops innovative thinking, entrepreneurial practice, business risk assessment, and market insight to foster creativity and business acumen. 3. Practical Ability: Strengthens design software proficiency, construction management, material application, and project reflection to ensure effective design execution. 4. Career Adaptability: Improves environmental adaptation, knowledge transfer, psychological resilience, and continuous learning, enabling students to thrive in dynamic work environments. 5. Employability: Focuses on professional knowledge, career planning, market adaptability, and ethics, ensuring competitiveness and career success. By cultivating these competencies, students enhance their industry readiness, fostering both creative and professional growth.

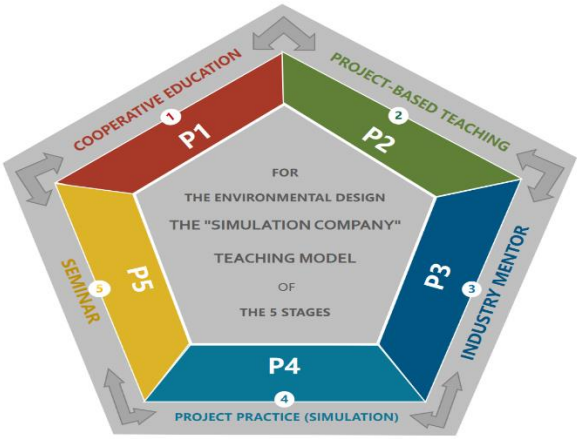


Figure 2: Model diagram (draft) of the 5 pedagogical phases of the pedagogical model of the environmental design 'simulation company'

Specific explanations for each stage of the "simulated company" teaching model:

P1-Pre-Project Communication Stage: This stage focuses on the preparatory work before project initiation, where students learn how to effectively communicate with clients to clarify project objectives, requirements, and expected outcomes. Students will practice skills in listening, questioning, and recording key information to ensure a clear understanding of the project.

P2-Project Conceptual Design Stage: In this stage, students will apply creative thinking skills, conduct brainstorming sessions, and generate design concepts. They will learn how to translate client needs and site conditions into innovative design solutions and begin creating preliminary design sketches and conceptual models.

P3-Detailed Design Development Stage: Students further develop and refine their concepts into detailed design plans in this stage. This includes selecting appropriate materials, colors, lighting, and layouts. Students will learn how to use design software to create precise technical drawings and 3D renderings.

P4-Design Construction Guidance Stage: This stage simulates the construction process, where students learn construction management skills, including supervising construction progress, ensuring the accuracy of design implementation, and solving on-site issues. They will also learn how to communicate effectively with contractors, suppliers, and engineers.

P5-Project Delivery Summary Stage: The final stage involves the final delivery and evaluation of the project. Students will present their design outcomes, gather feedback, and conduct a project debrief. This stage is about critical thinking and self-reflection; students will assess the successes and areas for improvement in the project.

Figure 3: Diagram of Teaching Methods for the "Simulation Company" Course in Environmental Design Major（Draft）

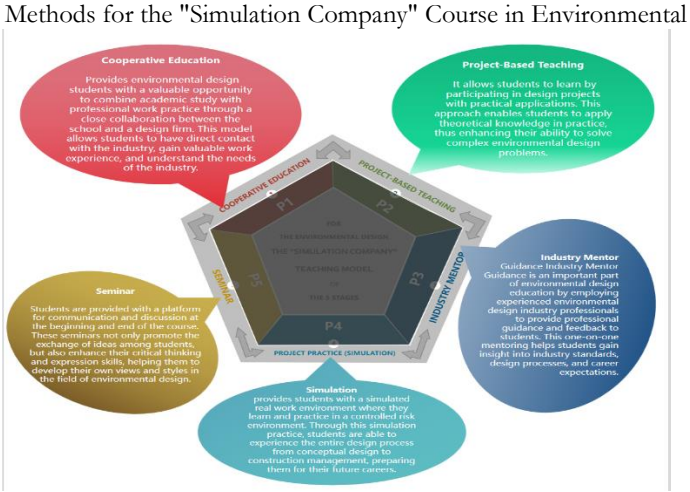


Figure 4: Detailed Diagram of Teaching Methods for the "Simulation Company" Teaching Model in Environmental Design Major (Draft)

The five teaching methods outside the shaded area in the two images above can be applied cyclically or simultaneously to the teaching model, including:

1. ***Project-Based Teaching:*** It allows students to learn by participating in design projects with practical application value. This method enables students to apply theoretical knowledge in practice, thereby enhancing their ability to solve complex environmental design problems.
2. ***Cooperative Education:*** Through close cooperation between schools and design companies, it provides students majoring in environmental design with a valuable opportunity to combine academic learning

with professional work practice. This model allows students to directly engage with the industry, gain valuable work experience, and understand industry needs.

3. ***Industry Mentor Guidance:*** Industry mentor guidance is an important part of environmental design education, providing students with professional guidance and feedback by hiring experienced experts in the environmental design industry. This one-on-one guidance helps students gain an in-depth understanding of industry standards, design processes, and career expectations.
4. ***Simulation:*** It provides students with a simulated real work environment, allowing them to learn and practice in a controlled risk environment. Through this simulation practice, students can experience the entire design process from conceptual design to construction management, preparing them for their future careers.
5. ***Seminar:*** It provides a platform for communication and discussion for students at the beginning and end of the course. These discussions not only promote the exchange of ideas among students but also enhance their critical thinking and expression skills, helping them form their own perspectives and styles in the field of environmental design.

These teaching methods interact cyclically or simultaneously within the teaching model, ensuring that students can develop their professional skills and professional qualities in a multi-dimensional, interactive learning environment. Through this comprehensive teaching approach, students not only acquire the necessary professional knowledge but also cultivate key professional abilities, preparing them for their future careers.

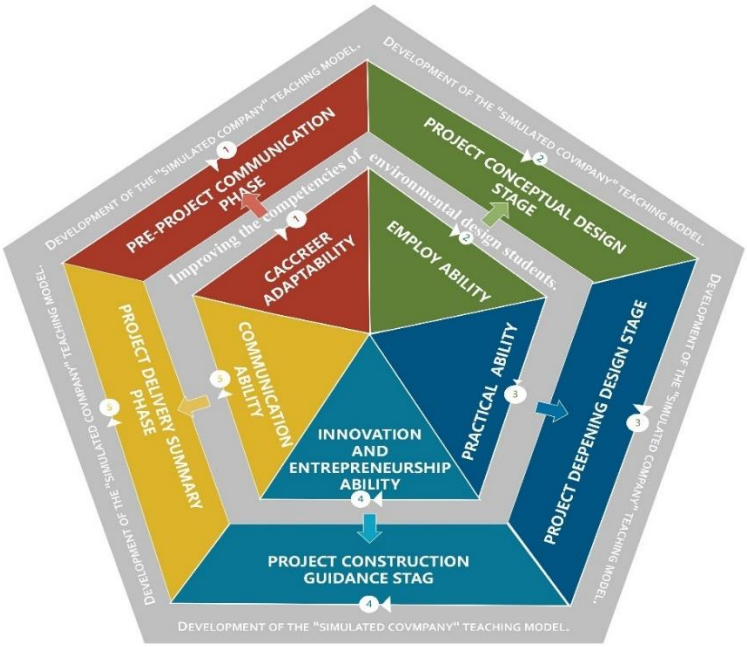


Figure 5: Draft teaching model diagram for "Simulated Company" for students majoring in environmental design

Teaching Model (Draft) Design Description:

This design proposes a teaching model with the core concept of "competency-oriented, practice-driven," aiming to build a multi-dimensional interactive teaching system. The core competency system of the model is based on five key competencies (communication skills, innovation and entrepreneurship skills, practical skills, professional adaptability, and employability) as the training objectives, forming a concentric structure for competency development. The model further divides the teaching process into five project phases, including (pre-project phase, project conceptual design phase, project in-depth design phase, project construction guidance phase, and project delivery and summary phase), to achieve a step-by-step advancement of competency training. In addition, the model adopts five teaching methods (project-based learning, cooperative education, industry mentor guidance, project practice, and seminars), which interact in a cyclical manner or simultaneously. Through the "double-loop optimization mechanism," it ensures sustainable development, where the inner loop involves teaching implementation, and the outer loop focuses on iterative updates to the model.

The innovative value of the model lies in proposing a three-dimensional coupling mechanism of "competency - project phase - teaching method." Ultimately, the model achieves a breakthrough in environmental design professional education through a "Simulated Company" environment that simulates real business scenarios: from knowledge transmission to competency forging, from passive learning to active innovation, from the separation of schools and enterprises to the symbiosis of industry and education, providing a replicable theoretical model and practical paradigm for teaching reforms in similar institutions.

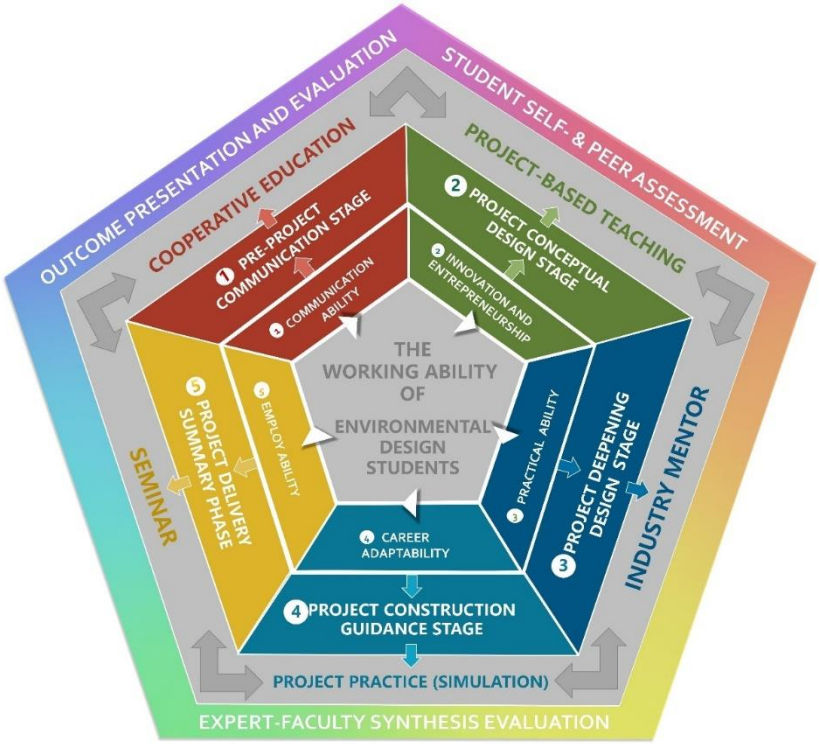
Phase 3: Adaptability and Feasibility Verification of the Teaching Model

This study categorized evaluation levels based on the mean value, with Level 5 being the highest. The overall assessment of the model's suitability and feasibility by seven experts reached 97.2% (M = 4.86, SD = 0.35 and 0.34, respectively).

Model Name: Rated the highest (M = 5.0), indicating clarity and appropriateness. Work Competency Map: Applicability (M = 4.57) exceeded feasibility (M = 4.43), highlighting a need for clearer definitions and a visually structured representation. Experts recommend a pentagon format to illustrate competency relationships. Teaching Stage Model Map: Rated highly (M = 4.71), reflecting strong alignment with industry practices. Experts suggest using descriptive labels instead of codes for better comprehension. Support Mechanism Teaching Strategy: Though theoretically strong, implementation challenges exist (M = 4.71 applicability, M = 4.43 feasibility). Experts emphasize strategic resource allocation, faculty training, and continuous evaluation. Overall Design Map: Received the lowest applicability score (M = 4.29) compared to feasibility (M = 4.71). Experts recommend refining details, adjusting colors, and avoiding coded representations. Structural Logic & Model Components: Both scored highly (M = 4.86), affirming the model's coherence and practicality. Research Steps: Applicability (M = 4.86) exceeded feasibility (M = 4.43), suggesting a need for clearer visual representation and explicit evaluation-feedback mechanisms. Scalability: Rated positively (M = 4.71), indicating potential for adaptation across disciplines and countries. Evaluation & Feedback Mechanism: Applicability (M = 4.43) was lower than feasibility (M = 4.57), indicating room for refinement. Experts propose making evaluation mechanisms more flexible to accommodate diverse real-world project scenarios. Overall, the "Simulated Company" teaching model demonstrates strong adaptability and feasibility, with recommendations for improving clarity, visual representation, and implementation strategies.

Model Optimization

Based on the above opinions, after research and adjustments, the researchers ultimately concluded a teaching model development (full version) to improve the work ability of environmental design students, which is mainly composed of the following 7 important parts:



The "Simulated Company" instructional model in the field of Environmental Design is deeply rooted in Outcome-Based Education (OBE), cooperative education philosophy, and constructivist learning theory. The core design objective of this model is to ensure the clarity and attainability of educational outcomes, ensuring that students can achieve predetermined learning outcomes through the learning process. Guided by the OBE concept, the instructional model focuses on setting clear learning objectives that are closely related to the core competencies of the Environmental Design field, such as innovative design thinking, project management, and communication and collaboration skills; the integration of cooperative education philosophy emphasizes interaction and

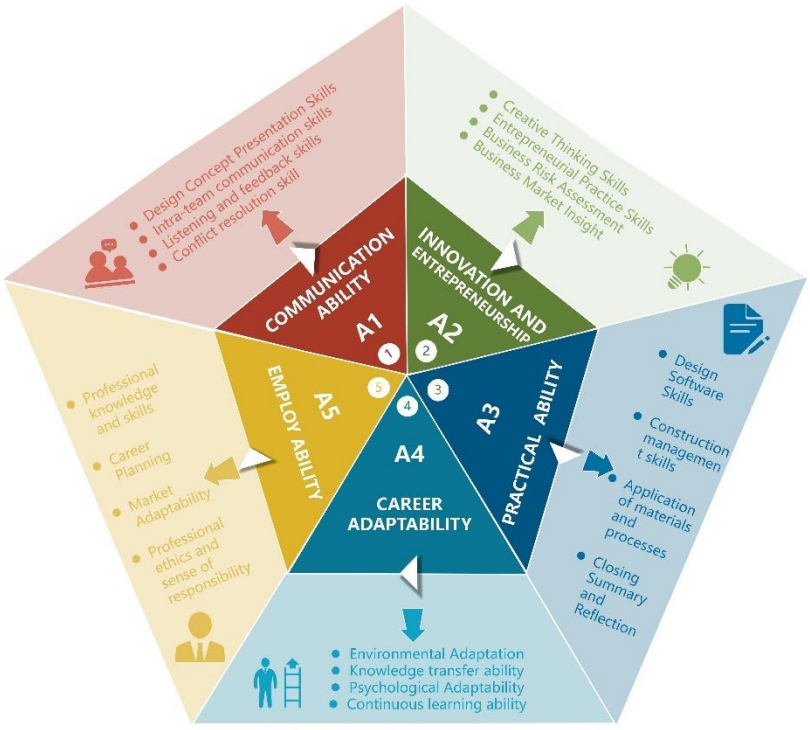
collaboration among students, as well as collaboration with industry experts, which not only promotes knowledge sharing and skill development but also simulates team collaboration in real work environments; constructivist learning theory posits that knowledge is constructed actively by learners rather than passively received. In the "Simulated Company" instructional model, students are placed in a simulated company environment, actively constructing and deepening their understanding of environmental design expertise through participating in project practice, case analysis, and problem-solving activities.

The core value of this instructional model is reflected in its construction of a multi-dimensional and interactive learning environment, allowing students to experience professional practice in a simulated professional setting, thereby promoting a comprehensive improvement of their professional skills and professional literacy. Through this integrated instructional strategy, students not only master the necessary professional knowledge but also cultivate key professional competencies, laying a solid foundation for their future careers. In addition, the model also motivates teachers to continuously adjust and optimize instructional content and methods based on student feedback and industry needs, to maximize teaching effectiveness.

Objectives of the teaching model: Cultivate students' innovative thinking and entrepreneurial practical skills: enhance students' abilities in design concept presentation, team communication, business risk assessment, and market insight; through simulating the work processes and workflows of a company, train students' professional and market adaptability.

Elements of the Teaching Model:

The main components of the "Simulated Company" teaching model in the Environmental Design major can be summarized from the inside out into three main core levels: 5 aspects of students' work capabilities: This is the foundational layer of the teaching model, aimed at improving the following abilities of students: A1-Communication Adaptability, A2-Innovation and Entrepreneurship Adaptability, A3-Practical Adaptability, A4-Career Adaptability, A5-Employability. The light-colored outer part of this diagram provides specific explanations for each of the abilities from A1 to A5.



- ***Student Self- & Peer Assessment:*** Students are encouraged to engage in self-reflection and collaborative learning through self-evaluation and peer assessment.
- ***Expert-Faculty Synthesis Evaluation:*** This evaluation combines the diverse perspectives of industry experts and faculty, providing comprehensive feedback that is both professional and academic.
- ***Outcome Presentation and Evaluation:*** Through the public display of project outcomes, multi-dimensional evaluation and feedback are received.

The teaching model forms a cyclical interactive system through these three levels of elements, which interact with each other and simultaneously function within the teaching model. This structure ensures students can learn autonomously in a multi-dimensional, interactive learning environment. In a non-destructive simulated work

environment, students can improve their work skills and enhance their self-confidence, ultimately achieving the desired teaching outcomes.

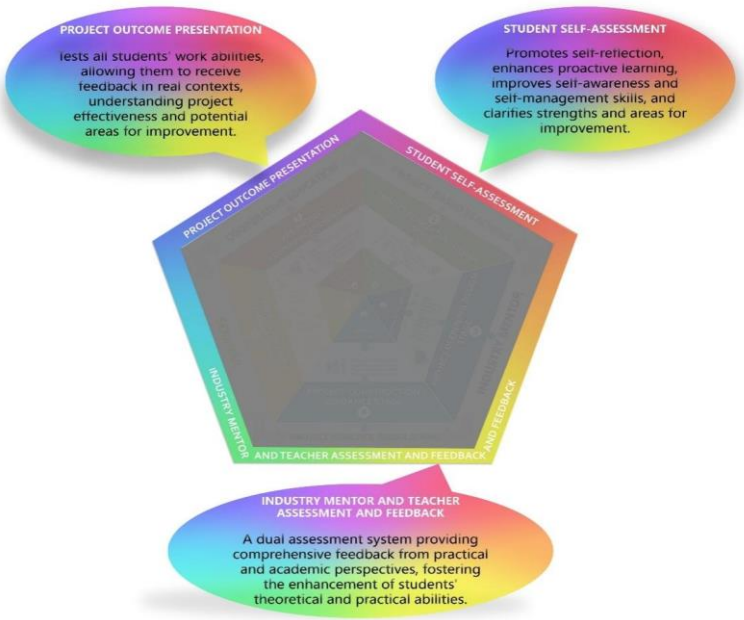
Teaching Strategies of the Instructional Model (Teaching Strategies)

5 teaching methods that can be cycled and applied simultaneously to the instructional model, including: project-based learning, cooperative education, industry mentor guidance, project practice, and seminars.

- ***Project-Based Teaching:*** It allows students to learn by participating in design projects with practical application value. This method enables students to apply theoretical knowledge in practice, thereby enhancing their ability to solve complex environmental design problems.
- ***Cooperative Education:*** Through close cooperation between schools and design companies, it provides students majoring in environmental design with a valuable opportunity to combine academic learning with professional work practices. This model enables students to gain direct industry exposure, acquire valuable work experience, and understand industry needs.
- ***Industry Mentor Guidance:*** Industry mentor guidance is an important part of environmental design education, providing students with professional guidance and feedback by hiring experienced experts from the environmental design industry. This one-on-one mentorship helps students gain an in-depth understanding of industry standards, design processes, and career expectations.
- ***Simulation:*** Provides students with a simulated real work environment, allowing them to learn and practice in a controlled risk environment. Through this simulation practice, students can experience the entire design process from conceptual design to construction management, preparing them for their future careers.
- ***Seminar:*** Provides a platform for communication and discussion for students at the beginning and end of the course. These discussions not only promote the exchange of ideas among students but also enhance their critical thinking and expression skills, helping them form their own perspectives and styles in the field of environmental design.

Methods of Teaching Quality Evaluation:

In the teaching model, the quality evaluation mechanism is a key component to ensure the quality and effectiveness of teaching activities. These three mechanisms can cycle, repeat, and self-adjust autonomously. They not only monitor the learning process but also provide valuable feedback to students, helping them understand their performance and areas for improvement. The following are the three main assessment and feedback mechanisms:



- ***Student Self- & Peer Assessment:*** Through self-assessment, students engage in a process of self-reflection, evaluating their own learning outcomes and progress. This mechanism encourages students to actively participate in the learning process, enhancing self-awareness and self-management skills. Through self-assessment and peer evaluation, students can more clearly recognize their strengths and areas needing improvement, thereby adjusting their learning strategies in a targeted manner and promoting self-reflection and collaborative learning.
- ***Expert-Faculty Synthesis Evaluation:*** Evaluations from industry mentors and faculty provide feedback from both professional and pedagogical perspectives. Industry mentors, with their rich practical experience, can assess students' performance from the perspective of industry needs, offering insights and suggestions from real-world work situations. Faculty members, on the other hand, evaluate students' learning outcomes and levels of understanding from an academic and teaching standpoint. This dual evaluation system ensures that students receive comprehensive feedback from both theoretical and practical dimensions.
- ***Outcome Presentation and Evaluation:*** Project outcome presentations are a form of public assessment where students present their project results to receive evaluations from peers, teachers, and industry mentors. This mechanism not only enhances students' communication and presentation skills but also allows them to receive feedback in real-world contexts, thereby better understanding the actual effects of their projects and potential areas for improvement.

These three assessment and feedback mechanisms complement each other, forming a comprehensive quality assurance system. Through these mechanisms, the teaching model ensures that teaching activities match the actual needs of students and industry standards, while also providing a platform for continuous improvement and enhancement for students. This comprehensive evaluation system contributes to the improvement of teaching effectiveness.

Analysis of the 2nd Assessment Results

Based on the evaluation results, the model's evaluation index is rated at an average score of 5.0, with a standard deviation of 0.0, and a grade rating of 5, consistent with the initial assessment results. In terms of the work capability graph, both the average score and standard deviation are 5.0 and 0.0, with a grade rating of 5 (applicability), and the average score and standard deviation are 5.0 and 0.0, with a grade rating of 5 (feasibility), showing significant improvement. For the teaching phase model graph, the average score and standard deviation are 5.0 and 0.0, with a grade rating of 5 (applicability), and the average score and standard deviation are 5.0 and 0.0, with a grade rating of 5 (feasibility), indicating improvement. In terms of the support mechanism model, the average score and standard deviation are 5.0 and 0.0, with a grade rating of 5 (applicability), the average score is 4.86, the standard deviation is 0.35, and the grade rating is 5 (feasibility), showing improvement. For the overall design graph, the average score and standard deviation are 4.86 and 0.35, with a grade rating of 5 (applicability), the average score is 4.83, the standard deviation is 0.38, and the grade rating is 5 (feasibility), indicating improvement.

In the comparative analysis of the two assessment results, we observed that the model name received the highest evaluation in terms of applicability and feasibility, indicating a high level of general recognition for the model's naming and ease of implementation. In the second assessment, the applicability and feasibility scores for the work capability graph and the teaching phase model graph both increased, suggesting that these aspects have gained further recognition after optimization. The applicability score for the support mechanism model also increased in the second assessment, demonstrating the stability of this model in terms of applicability. Although the overall design graph score increased in the second assessment, it still ranked lower than other projects, indicating that there is still room for improvement in this area.

The overall trend of the second assessment results shows improvements in the model across multiple aspects, particularly in the work capability graph and the teaching phase model graph, which may reflect further optimization and adjustments to the model's details. Through this comparative analysis, we can identify improvements and adjustments in the implementation of the teaching model, as well as areas that may require more attention and resource investment. This continuous evaluation and feedback mechanism is crucial for ensuring the effectiveness and adaptability of the teaching model, and it contributes to the model's ongoing improvement and adaptation to changes in teaching needs.

DISCUSSION

The validation process of the "Simulated Company" teaching model demonstrated significant improvements in both appropriateness and feasibility, reinforcing its potential for effective implementation in environmental design education. The second-round assessment revealed that key model components—including the model's name, work ability diagram, and teaching stage diagram—achieved perfect scores ($\bar{x} = 5.0$, SD = 0.0), reflecting strong clarity, alignment with educational objectives, and practical applicability. Additionally, the overall design and support mechanism model saw notable enhancements, particularly in clarity, functionality, and adaptability to industry needs. Experts highly praised the model's refined visual design, which improved accessibility and user engagement. Modifications in color schemes, graphic elements, and layout enhanced its readability and practicality, while optimized content and modernized icons increased usability. These refinements align with the findings of Zhang (2023), who emphasized the importance of clearly defining educational model components to facilitate effective implementation and alignment with learning outcomes. Furthermore, the revised evaluation and feedback mechanisms provided more structured guidance, ensuring adaptability in dynamic teaching environments. This is consistent with Chernikova et al. (2020), who highlighted the necessity of an iterative evaluation process to maintain the relevance and effectiveness of teaching models in evolving educational contexts. The study also underscores the need for well-structured support mechanisms—such as resource allocation and coordination management—to bridge the gap between theoretical frameworks and real-world applications, a perspective supported by Yang (2020).

Overall, this study reaffirms that a structured, adaptable, and visually intuitive teaching model can enhance environmental design education. By integrating expert feedback and refining key components, the model now presents a well-balanced approach to preparing students for industry demands while maintaining academic rigor.

New Knowledge from Research

This study has conducted an in-depth exploration and improvement of teaching model design across four key dimensions (see Figure 5). First, the study identified significant gaps in the career preparedness of environmental design students, particularly the lack of practical experience and key professional skills. This finding resonates with existing discussions in the literature regarding the misalignment between education and industry needs, emphasizing the importance of practice-oriented learning in the educational process. Second, the study highlighted the misalignment between educational content and industry needs, a long-standing topic in higher education research, especially in the context of adjusting trends in the environmental design major and matching regional key industries. Third, the study proposed the establishment of a simulated company teaching model to enhance students' occupational adaptability, employability, and key competencies. This teaching model aims to strengthen

students' practical skills and professional literacy through a simulated real-work environment. Finally, through expert validation and iterative optimization of the teaching model, its feasibility and effectiveness were ensured. This included refining components such as the competency diagram, teaching stages, and support mechanisms. This iterative process not only underscored the role of expert input in aligning education with industry needs but also highlighted the importance of model validation and refinement in educational research. Through such research and improvement, the efficiency and effectiveness of the educational system can be enhanced, better preparing students for their future career development.

RECOMMENDATIONS

(1) For Environmental Design Firms

This study highlights the gap between university training and industry needs in Xinxiang's environmental design sector, emphasizing university-industry collaboration. The "Simulated Company" teaching model bridges this gap by immersing students in real industry workflows, enhancing professional awareness, and enabling firms to identify and nurture talent early. Firms can integrate this model into campus recruitment, using it for talent assessment, cultural integration, and pre-onboarding training. This reduces training costs and accelerates employee adaptation. By aligning education with industry demands, the model fosters competitive, innovative professionals, driving industry growth and ensuring a steady pipeline of skilled talent for environmental design firms.

(2) For Universities Offering Environmental Design Majors

The "Simulated Company" teaching model innovates environmental design education by integrating real industry challenges into the curriculum. It is recommended for fourth-year students, emphasizing five project stages to build core competencies. Industry collaboration ensures alignment with market demands, while regular updates maintain relevance. This model strengthens university-enterprise integration, fostering high-quality, industry-ready talent. Unlike traditional teaching, it encourages student autonomy, simulating real business operations through a "learning-by-doing" approach. Universities should support this model as a talent incubation base, reducing control to enhance experiential learning. This approach bridges education and industry, ensuring graduates meet evolving professional and societal needs.

(3) For Teachers of Environmental Design

Effective implementation of the "Simulated Company" teaching model requires clear guidelines, visual tools, and optimized resource management. Targeted evaluation tools and iterative feedback will enhance adaptability. This model encourages student-centered approaches like project-based learning, industry mentorship, and seminars, fostering engagement, critical thinking, and problem-solving skills. Educators must continuously update their knowledge, integrating theory with practice while guiding students in project execution. Acting as mentors and evaluators, teachers will support professional growth. This method enhances both student learning and educators' development, driving innovation in teaching. As adoption expands, it will become a key tool for advancing environmental design education.

(4) For Environmental Design Students:

The "Simulated Company" teaching model bridges academic learning and professional practice for environmental design students, offering industry-related experiential learning. It guides students through five stages: project communication, conceptual design, detailed design, construction guidance, and project delivery, enhancing adaptability, employability, and innovation. Simulated projects strengthen design, material selection, construction management, and cost estimation skills while fostering teamwork and communication. Career guidance programs tailored to Xinxiang's job market further support students' career exploration. This method builds confidence, innovation, and adaptability, ensuring graduates are industry-ready. It provides a dynamic learning environment that fully prepares students for future career challenges.

LIMITATIONS OF THE RESEARCH SAMPLE:

The samples selected in this study mainly come from environmental design students in Xinxiang, Henan, China. Although these samples have a certain degree of local representativeness, the representativeness of the samples still needs to be expanded. This limits the generalizability of the research findings and may also affect the in-depth understanding of different student characteristics. To enhance the representativeness and external validity

of the study, future research should consider expanding the sample scope to include student groups from different regions and backgrounds.

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