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Research On The Quality Improvement Path Of Innovation And Entrepreneurship Education In The Digital Context—Restructuring Key Elements And Integrating Teaching Practices

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Abstract:
Digital transformation is fundamentally reshaping the higher education ecosystem, presenting a historic opportunity to address the long-standing disconnect between knowledge and practice in innovation and entrepreneurship education. Based on field observations and systematic research across multiple universities, this paper proposes a dual-driven strategy centered on "key element restructuring" and "integration of teaching practices," aiming to comprehensively enhance the effectiveness and contemporary relevance of innovation and entrepreneurship education. The study identifies five core challenges in the current educational system: outdated content, traditional methodologies, single-dimensional evaluation, insufficient digital literacy among faculty, and underdeveloped practical platforms. For instance, universities face issues such as incomplete curriculum design, inadequate faculty specialization, and lagging practical platform development. To address these challenges, the paper systematically constructs a digital-driven element restructuring model encompassing five dimensions: teaching content, pedagogical methods, assessment systems, faculty development, and resource environments. It further proposes three actionable pathways: integrated "curriculum-project-competition" systems, "school-enterprise interdisciplinary" collaborative education, and blended "online-offline" teaching models. Practical implementation demonstrates that this framework effectively stimulates students' innovative potential, enhances entrepreneurial competencies, and provides a valuable reference model for innovation and entrepreneurship education reform in similar institutions.

Keywords: *Digital transformation; Innovation and entrepreneurship education; Quality improvement; Factor restructuring; Teaching practice*

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I.Introduction: Education Challenges And Opportunities In The Era Of Digital Transformation

Under the guidance of innovation-driven development strategies, university entrepreneurship education has evolved from peripheral exploration to a core domain of talent cultivation. However, Deng (2025) highlights a critical reality: many institutions still struggle with a path dependency that prioritizes theory over practice, formalities over substance, and technical skills over holistic development. As the digital economy continuously spawns new business models and operational paradigms, traditional education systems appear increasingly inadequate in updating curricula, innovating teaching methodologies, and building sustainable educational ecosystems.

Wang et al. (2025) and Fang & Chen (2024) identified three structural contradictions: curriculum content disconnected from industrial practices, teaching methodologies failing to stimulate deep learning, evaluation systems inadequately measuring innovation literacy and entrepreneurial capabilities, and faculty teams lacking digital-era pedagogical competence. Practical platforms also struggle to support interdisciplinary and cross-regional collaborative innovation. Against this backdrop, this study explores an effective pathway to substantially elevate the quality of innovation and entrepreneurship education by using digital transformation as a catalyst. By systematically restructuring key educational elements and deeply integrating them into teaching practices, we aim to achieve transformative improvements in innovation and entrepreneurship education.

II. Challenges: Five dimensions of disconnection in innovation and entrepreneurship education

Through the investigation and analysis of many application-oriented undergraduate colleges, it is found that there are five "disconnections" in the current innovation and entrepreneurship education:

Outdated Education Content, Out of Step with the Digital Economy

Many course materials and case libraries have not been updated in a timely manner, neglecting to incorporate knowledge systems from emerging fields such as big data, artificial intelligence, and the platform economy. Chen and Li (2024) highlighted the "knowledge gap" between the knowledge students acquire and the real-world entrepreneurial needs, which poses challenges for them to identify opportunities and integrate resources in the rapidly evolving digital landscape.

Traditional Teaching Methods with Low Student Engagement and Creativity

Although case teaching and group discussions have been relatively popular, deep interaction, simulation, and project-based learning utilizing digital tools have not become mainstream. These teaching methods fail to create a learning environment with high immersion and participation, hindering the transformation of students from passive recipients to active participants.

Monotonous Teaching Evaluation, Insufficient Attention to Process and Development

Xu et al. (2024) point out that current evaluation systems overly emphasize summative outcomes such as business plans and final reports, while neglecting the continuous assessment of critical competencies like innovative thinking processes, teamwork, and iterative capabilities. To address this, educators could adopt diversified evaluation methods, including quantitative metrics, assessment models, total score systems, fuzzy mathematics, weighted scoring, and the Analytic Hierarchy Process (AHP). These approaches provide a more comprehensive reflection of students' innovation capabilities and facilitate a deeper evaluation of creative thinking processes, collaborative skills, and iterative development. The "one-shot evaluation" model fails to offer sustained feedback for teaching improvement and student growth.

Insufficient Digital Literacy Among Teachers and Need for Improved Practical Guidance

While most instructors teaching innovation and entrepreneurship courses have solid theoretical foundations, their understanding and application of digital technologies vary significantly. Many lack the ability to design instructional activities using digital tools or to guide students in practical implementation. Furthermore, Bao (2020) noted that teachers generally lack frontline industry experience, resulting in superficial guidance on digital entrepreneurship.

Weak Practical Platforms, Insufficient Integration of Industry and Education, and Interdisciplinary Collaboration

Current industry-academia collaborations remain limited to superficial interactions such as lectures and site visits, lacking a sustainable framework for deep project collaboration through digital platforms. Barriers in management mechanisms and resource sharing hinder the effective implementation of interdisciplinary projects, resulting in insufficient development of students' comprehensive problem-solving capabilities.

III. Reconstructing The Path: Upgrading Key Elements With Digitalization At The Core

In the face of the aforementioned challenges, the key elements of innovation and entrepreneurship education must undergo systematic and digital reconstruction.

Teaching Content Reconstruction: From Static Knowledge to Dynamic Ecology

Huang and Chen (2024) as well as Chen and Li (2024) proposed that we should move away from a content system centered on fixed textbooks and construct a "dynamic digital content ecosystem." This ecosystem should integrate three key resources: First, incorporating cutting-edge modules such as "digital literacy," "data-driven decision-making," and "AI-powered innovation"; second, establishing a "digital entrepreneurship case library" that aggregates fresh examples from the new economy sector; third, developing a "virtual simulation entrepreneurship project library" that is integrated with professional courses, allowing for the continuous evolution of teaching content to keep pace with the times.

Teaching Methodology Restructuring: From One-Way Instruction to Collaborative Inquiry

Fang and Chen (2024) advocated for a pedagogical shift from teacher-centered to student-centered approaches, actively promoting blended learning and Project-Based Learning (PBL) through online platforms. These digital platforms primarily serve knowledge delivery and resource coordination functions, while in-person classes emphasize high-value team collaboration, solution brainstorming, and personalized guidance. Additionally, virtual simulation experiments are introduced to enable students to conduct decision-making and trial-and-error practices within highly realistic market environments, thereby enhancing the immersive experience and practical effectiveness of learning.

Reconstructing Teaching Evaluation: From Single Judgment to Multiple Diagnoses

Xu et al. (2021) emphasized the need to establish an "integrated evaluation system incorporating multi-source data." By utilizing learning management systems to track students' online learning behaviors, project management tools to monitor task progress and collaborative contributions, and combining project outcome presentations with competition performance for comprehensive assessment. This restructuring shifts evaluation from static "judgment" to dynamic "diagnosis," aiming to comprehensively demonstrate students' competency development while providing data-driven support for instructional optimization.

Faculty Restructuring: From Knowledge Authority to Innovation Coach

Bao (2020) emphasized the implementation of the "Teacher Digital Teaching Competency Enhancement Program," utilizing formats such as workshops and teaching salons to focus on digital teaching design and tool application. Meanwhile, a "Industry Mentor Database" was established, employing a flexible recruitment mechanism to hire corporate experts. Through online workshops and project guidance, these mentors collaborate with in-house faculty to form a "dual mentorship system" that jointly guides students' practical training.

Resource Environment Reconstruction: From Physical Place to Borderless Innovation Field

Bao (2020) proposed integrating online courses, virtual experiments, and industry resource repositories to build a one-stop "Digital Innovation and Entrepreneurship Education Platform." This platform not only supports ubiquitous learning but, more importantly, provides a digital foundation for cross-disciplinary teamwork and university-enterprise project collaboration. Building on this, it actively fosters an innovation culture that encourages exploration and embraces failure, creating an open, collaborative, and sustainable innovation ecosystem without boundaries.

IV. Practice Integration: Integration And Implementation Of Three Core Pathways

The blueprint for element reconstruction must rely on a clear path of practice to be transformed into educational productivity. We have designed and verified three core pathways.

The "Course-Project-Competition" Integrated Approach

Deng (2025) emphasizes the necessity of fully integrating curriculum instruction, project-based learning, and academic competitions. For example, in the Entrepreneurship Fundamentals course, student teams are required to develop and design a digital entrepreneurship project within the semester, with this project serving as the core assessment. Outstanding projects will be directly recommended for high-level competitions and receive ongoing incubation guidance. The digital platform acts as the "vein" connecting these three elements, ensuring the smooth flow and transformation of creativity, knowledge, and practical outcomes.

The "School-Enterprise-Interdisciplinary" Collaborative Education Path

Collaborating with partner enterprises, we have established "Cloud Project Workshops," where companies present real-world business challenges or innovative topics. Chen and Li (2024) highlight that digital platforms can recruit students from diverse disciplines to form interdisciplinary teams. Through remote mentoring by corporate advisors and university faculty, students develop solutions within set timelines. This approach not only enhances students' professional competencies but also cultivates crucial cross-disciplinary collaboration skills.

The "Online-Offline" Blended Teaching Path

We have meticulously established an O2O teaching closed-loop that progresses through five stages: "online theoretical learning and case analysis → offline workshops and team co-creation → online solution iteration and resource integration → offline roadshow presentations and evaluation feedback." This pathway systematically redesigns the teaching process based on the objective laws of knowledge internalization and skill development, aiming to fully leverage the strengths of both online and offline approaches while enhancing teaching efficiency and depth.

V. Results And Reflections: Practical Implications And Future Prospects

In pilot programs at several universities, the blended O2O teaching model has demonstrated remarkable effectiveness. For instance, Guangzhou University has significantly boosted students' confidence in innovation, digital tool proficiency, and teamwork capabilities through MOOCs and platforms like "Yu Classroom". The innovative quality and completeness of project outcomes surpass those of traditional teaching methods. More importantly, students' learning motivation has shifted from external pressure to intrinsic interest, marking a paradigm shift from "I have to learn" to "I want to innovate".

However, some challenges have also been exposed in the practice process. Some students are not used to the highly autonomous and collaborative learning mode at the initial stage; meanwhile, this puts forward higher requirements for teachers' curriculum design and process guidance ability, which requires corresponding teacher support and incentive mechanisms.

Looking ahead, the digital transformation of innovation and entrepreneurship education will bring about profound ecological changes. This requires universities to implement strategic top-level design and provide robust institutional, resource, and cultural support. Future research should continuously monitor the disruptive impact of emerging technologies like generative artificial intelligence on educational paradigms, while tracking students' long-term development trends to continuously refine this reform model.

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