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Research on the Effectiveness of Innovation and Entrepreneurship Education in Vocational Undergraduate Colleges under the Guidance of High Quality Employment

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Abstract: This paper systematically investigates effective strategies to enhance innovation and entrepreneurship education in vocational undergraduate institutions, with a focus on aligning educational practices with high-quality employment objectives. Based on empirical research conducted across 25 vocational undergraduate institutions nationwide, the study identifies several key challenges impeding the effectiveness of innovation education, including a persistent curriculum-employment mismatch, inadequate practical teaching resources, limited exposure to real-world projects, and underdeveloped mechanisms for sustained industry-academia collaboration. Drawing on competency-based education theory and human capital theory, the research proposes a comprehensive framework of optimization strategies encompassing four interrelated dimensions: curriculum restructuring to integrate entrepreneurial competencies and emerging industry requirements, enhancement of practical training platforms to provide hands-on experience and simulation opportunities, deepening of industry-academia partnerships to foster experiential learning and mentorship, and refinement of evaluation systems to measure both knowledge acquisition and applied innovation capability. These strategies collectively establish a closed-loop system that links theoretical instruction, practical training, and employment conversion, ensuring that students acquire both the cognitive and practical skills necessary for entrepreneurial success. Empirical results demonstrate that the proposed framework significantly enhances students' career competitiveness, improves employment outcomes, and strengthens their capacity for innovation-driven problem solving. Furthermore, integrating innovation and entrepreneurship education with high-quality employment objectives contributes to the broader goals of vocational undergraduate education, supporting socioeconomic development by cultivating a workforce that is both technically proficient and adaptable to evolving industry demands. The study offers actionable insights for educators, policymakers, and institutional administrators seeking to reform and optimize vocational education curricula in line with contemporary labor market needs.

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1. Introduction

Amid China's vigorous promotion of vocational undergraduate education, the "Guidelines for Advancing High-Quality Development of Modern Vocational Education" explicitly emphasize that vocational bachelor's programs should prioritize employment outcomes while responding effectively to industrial demands. In the context of increasingly competitive job markets, high-quality graduates are expected not only to possess solid professional skills but also to demonstrate strong innovative thinking, problem-solving abilities, and entrepreneurial competencies. These expectations place

significant pressure on vocational institutions to cultivate students who are versatile, adaptable, and capable of navigating complex and evolving work environments. Innovation and entrepreneurship education serves as a crucial pathway for developing such comprehensive vocational competencies, enabling students to integrate theoretical knowledge with practical application, explore creative solutions, and engage in entrepreneurial activities [1].

Despite these objectives, significant challenges continue to constrain the effectiveness of innovation and entrepreneurship education in vocational undergraduate institutions. First, curriculum content frequently misaligns with current market requirements, focusing excessively on theoretical knowledge while neglecting the practical skills and industry-specific competencies demanded by employers. Second, practical training opportunities remain limited or superficial, often failing to expose students to real-world problem-solving scenarios, collaborative projects, or enterprise-driven innovation tasks. Third, mechanisms for sustained and deep industry-academia collaboration are underdeveloped, resulting in a gap between educational delivery and workplace expectations [2]. Collectively, these limitations hinder the ability of vocational institutions to produce graduates who are fully prepared for high-quality employment and entrepreneurial endeavors.

Enhancing the practical impact and employment relevance of innovation and entrepreneurship education has therefore become a central focus of vocational undergraduate reform. This entails integrating competency-based education principles, which emphasize the development of specific skills and capabilities aligned with industry standards, and human capital theory, which recognizes the role of education in enhancing employability and economic productivity. Strategies such as curriculum restructuring, expansion of practical training platforms, establishment of mentorship programs, and construction of evaluation systems linking learning outcomes to employment success are increasingly recognized as critical interventions [3]. Moreover, policy directives at the national and regional levels advocate for systematic collaboration between educational institutions, enterprises, and government agencies, promoting an ecosystem in which innovation education is directly tied to labor market needs and entrepreneurial opportunities.

In this context, vocational undergraduate institutions face both an opportunity and a responsibility to design education programs that not only impart foundational knowledge but also cultivate innovative mindsets, entrepreneurial initiative, and applied problem-solving skills [4]. By establishing a closed-loop system that connects theoretical instruction, practical training, and employment conversion, institutions can ensure that students are equipped to meet the evolving demands of modern industries while contributing to socioeconomic development. The focus on high-quality employment outcomes also necessitates a continuous feedback loop, whereby curriculum design and teaching practices are regularly informed by labor market trends, employer expectations, and student performance metrics, creating a dynamic and responsive educational environment.

In summary, this study situates innovation and entrepreneurship education within the broader objectives of vocational undergraduate reform, emphasizing the critical role of employment-oriented strategies in bridging the gap between education and industry. By addressing curriculum misalignment, enhancing practical training, and fostering robust industry-academia partnerships, vocational institutions can significantly improve the career competitiveness of graduates, promote entrepreneurial activity, and contribute to national economic development. The following sections of this paper explore empirical findings, identify key challenges, and propose actionable strategies to optimize innovation and entrepreneurship education in line with high-quality employment objectives [5].

2. Theoretical Basis of Innovation and Entrepreneurship Education under the Orientation of High-Quality Employment

2.1. Competency-Based Education Theory

Competency-based education (CBE) theory emphasizes the establishment of talent development systems centered on occupational requirements and practical capabilities. Under the guidance of high-quality employment objectives, innovation and entrepreneurship education must adopt a systematic and targeted approach in designing curricula, teaching content, and assessment methods that are closely aligned with the evolving demands of the job market. Specifically, CBE highlights the cultivation of students' innovative thinking, entrepreneurial mindset, problem-solving skills, and applied technical competencies. By integrating experiential learning, project-based assignments, and industry-relevant case studies into the curriculum, educational programs can ensure that students are equipped to tackle real-world challenges effectively. This approach not only fosters practical proficiency but also ensures a precise alignment between educational resources and employment needs, thereby enhancing students' employability and readiness to contribute to modern industrial and entrepreneurial ecosystems. Moreover, competency-based frameworks encourage continuous assessment and feedback mechanisms, allowing institutions to adjust educational strategies dynamically in response to labor market trends and technological advancements.

2.2. Human Capital Theory

Human capital theory posits that investment in education enhances an individual's knowledge, skills, and overall productivity, ultimately improving employability, income potential, and career mobility. Within this theoretical framework, innovation and entrepreneurship education is considered a strategic form of human capital investment, cultivating students' creativity, initiative, entrepreneurial capabilities, and professional competencies. By engaging students in entrepreneurial simulations, innovation projects, and collaborative problem-solving activities, educational programs directly contribute to the accumulation of human capital that is valued by employers. This not only strengthens students' individual competitiveness in the labor market but also lays a solid foundation for achieving high-quality employment outcomes that emphasize both technical proficiency and innovative capacity. Furthermore, human capital theory underscores the long-term societal and economic benefits of such educational investments, as graduates equipped with entrepreneurial skills and innovative thinking can drive enterprise growth, technological progress, and broader socioeconomic development. Integrating this perspective into vocational undergraduate programs ensures that innovation and entrepreneurship education is both practically relevant and strategically oriented toward producing a workforce capable of meeting contemporary industry challenges.

3. Current Situation and Problems of Innovation and Entrepreneurship Education in Vocational Undergraduate Colleges

3.1. Survey Design and Data Analysis

This study employed a mixed-method approach combining questionnaire surveys and semi-structured interviews to comprehensively investigate the state of innovation and entrepreneurship education in vocational undergraduate institutions. A total of 382 valid questionnaires were collected from students across 25 vocational undergraduate colleges in China, complemented by in-depth interviews with 23 administrators and faculty members responsible for innovation and entrepreneurship programs. The survey findings reveal several critical insights:

- 1) Curriculum Structure: Approximately 78.6% of institutions primarily rely on theoretical instruction in their innovation and entrepreneurship courses, with

limited integration of professional characteristics or alignment with employment demands.

- 2) **Practical Teaching:** About 65.3% of schools dedicate less than 30% of class hours to hands-on training, with practical components often disconnected from authentic workplace scenarios, reducing the applicability of students' learning outcomes.
- 3) **Industry-Academia Collaboration:** Only 29.4% of surveyed institutions have established joint innovation projects with enterprises, indicating that partnerships remain shallow and lack sustainable mechanisms.
- 4) **Student Perceptions:** 81.2% of students reported that current innovation and entrepreneurship education provides limited support for enhancing employability, reflecting a significant gap between educational objectives and student expectations.

3.2. Core Issues Analysis

Curriculum-Employment Disconnect: The current curriculum system largely fails to meet the evolving demands of the job market. Most innovation and entrepreneurship courses are generalist in nature, lacking specialization for different professional fields. For example, programs for intelligent manufacturing majors rarely incorporate cutting-edge industry trends such as industrial internet technologies or smart equipment innovation. This misalignment reduces students' ability to apply theoretical knowledge to real-world problems and constrains the cultivation of industry-relevant skills.

Insufficient Practical Teaching Resources: Many institutions face limitations in practical training infrastructure. On-campus training bases often feature outdated equipment and simulated environments that do not reflect actual enterprise operations. Off-campus internship bases frequently lack stable, long-term collaboration mechanisms with enterprises, hindering opportunities for authentic entrepreneurial practice. Survey data indicate that 62.5% of college business incubation bases cease operations prematurely, leaving students with limited access to hands-on entrepreneurial experiences.

Underdeveloped Industry-Academia Collaboration: Collaborative mechanisms between schools and enterprises remain superficial. Enterprises generally participate in limited capacities, such as offering internships, rather than engaging in curriculum co-design, project guidance, or mentoring. The absence of a shared benefit and incentive mechanism prevents the establishment of sustainable and mutually beneficial partnerships, restricting students' exposure to real-world innovation practices.

Non-Scientific Evaluation Systems: Current evaluation approaches for innovation and entrepreneurship education primarily rely on traditional methods, such as exam scores and internship reports, which fail to capture the full spectrum of students' capabilities. Comprehensive assessment of innovative thinking, entrepreneurial practice skills, and the conversion of learning into employment outcomes is largely absent. This single-dimensional evaluation framework cannot accurately reflect the effectiveness of educational interventions or inform ongoing curriculum improvements.

Collectively, these issues highlight the need for systemic reforms in vocational undergraduate institutions. Addressing curriculum misalignment, expanding practical training resources, strengthening sustainable industry-academia partnerships, and developing comprehensive evaluation frameworks are essential steps toward enhancing the quality and effectiveness of innovation and entrepreneurship education. Such measures not only improve students' employability but also contribute to cultivating a generation of graduates equipped with practical skills, innovative mindsets, and entrepreneurial competencies aligned with modern industrial needs.

4. The Effective Improvement Path of Innovation and Entrepreneurship Education under the Guidance of High-Quality Employment

4.1. Restructuring the Curriculum System and Strengthening Employment Orientation

To effectively enhance innovation and entrepreneurship education, vocational undergraduate institutions should develop modular and integrated curricula that combine "foundational theories + professional applications + practical innovation." The foundational theory module focuses on cultivating students' innovative thinking, entrepreneurial mindset, and understanding of basic business principles. The professional application module delivers discipline-specific courses tailored to industry trends and vocational specializations, such as "E-commerce Live Streaming Innovation Practice" for marketing-related majors or "Smart Manufacturing Technology Application" for engineering students. The practical innovation module emphasizes immersive, project-based training, equipping students with the problem-solving capabilities required for real-world entrepreneurial and industrial challenges.

Integrating professional standards into curriculum design is essential. By incorporating occupational qualification criteria, industry-specific competencies, and employment requirements, institutions can develop innovation and entrepreneurship courses that closely align with the needs of the job market. For example, logistics management programs could incorporate modules on smart logistics systems, supply chain optimization, and digital inventory management, fostering students' ability to respond innovatively to emerging industry demands.

Moreover, the curriculum should encourage the integration of courses with certification pathways. Linking innovation and entrepreneurship education with vocational skill-level certificates enables students to earn credentials such as online store operator or entrepreneurial instructor certificates. This dual recognition-academic achievement plus certified professional competency-enhances students' employability and competitive edge in the labor market.

4.2. Optimizing Practical Teaching and Enhancing Practical Ability

Practical teaching should be diversified and immersive. On-campus training bases can establish simulated entrepreneurship laboratories, innovation workshops, and maker spaces that integrate real corporate projects and operational processes to create authentic experiential learning environments. Off-campus internships should be strategically designed in collaboration with industry leaders, creating innovation practice centers that allow students to participate in actual business projects, product development, and market research.

The integration of online virtual platforms can further expand practical opportunities. By leveraging VR/AR, big data, and simulation technologies, institutions can recreate the entire lifecycle of enterprise operations-from product design and marketing to financial planning-providing students with risk-free, interactive entrepreneurial experiences.

Project-based education should become a cornerstone of practical training. Students can engage in real-world entrepreneurial projects encompassing market research, product design, marketing strategy, and operational management. For example, partnerships with local enterprises on rural revitalization initiatives allow students to apply innovation skills to societal challenges, developing both technical proficiency and social responsibility. A dual-mentor system-comprising academic faculty and enterprise professionals-can guide students throughout the project lifecycle. Academic mentors provide theoretical guidance and methodological training, while enterprise mentors contribute practical insights, resource access, and real-world problem-solving support, ensuring a holistic development experience.

4.3. Deepening School-Enterprise Collaboration and Innovating Educational Models

Establishing robust collaborative mechanisms between schools and enterprises is essential for aligning education with industry needs. Creating an innovation and entrepreneurship education steering committee composed of enterprise executives, school administrators, and industry experts can oversee the design of talent training programs, curriculum standards, and practical teaching plans, ensuring education keeps pace with industrial and technological developments.

Innovative collaboration models include:

- 1) Customized Training Programs: Formal agreements with enterprises to design talent development pathways based on specific organizational needs.
- 2) Industry-School Partnerships: Establishing joint innovation-focused institutes to enable resource sharing and collaborative cultivation of skilled professionals.
- 3) Collaborative R&D Projects: University-enterprise collaborations can translate research outcomes into practical educational resources, such as student-accessible technological prototypes, innovation toolkits, and case studies for applied learning.

To motivate enterprise engagement, institutions should establish benefit-sharing mechanisms that provide incentives such as tax reductions, project subsidies, and intellectual property sharing. Successful partnerships and exemplary cooperation cases can be formally recognized through awards, enhancing enterprises' commitment to sustained involvement in educational initiatives.

4.4. Improving the Evaluation System to Ensure the Effectiveness of Education

Developing a diversified evaluation framework is critical to assessing the effectiveness of innovation and entrepreneurship education. The framework should encompass three key dimensions:

- 1) Innovation Capability: Metrics include the number and quality of creative proposals, patent applications, and novel solutions developed by students.
- 2) Entrepreneurial Practice: Evaluation of project operations, funding acquisition, and operational outcomes to assess students' applied entrepreneurial skills.
- 3) Employment Quality: Indicators such as alignment of job roles with major, salary levels, career growth trajectory, and post-graduation entrepreneurial activity.

This evaluation framework should integrate multi-stakeholder feedback, including student self-assessment, faculty evaluation, corporate mentorship feedback, and societal impact assessments. Corporate evaluations specifically focus on students' innovative performance during internships and collaborative projects, while societal evaluations assess the broader contributions of graduates' entrepreneurial endeavors to local and regional development.

The application of evaluation outcomes should directly inform curriculum design, teaching methods, and talent training programs. By establishing an incentive mechanism, outstanding achievements in innovation and entrepreneurship—both by students and faculty—can be formally recognized, fostering a culture of excellence and continuous improvement within vocational undergraduate institutions.

5. Case Study: The Practical Exploration of Shenzhen Vocational and Technical University

5.1. Innovative Talent Training Model

Shenzhen Vocational and Technical University, guided by the principle of high-quality employment, has developed a comprehensive "trinity" innovation and entrepreneurship education model that integrates curriculum design, practical platforms, and service systems. The **curriculum system** includes foundational and professional modules such as "Fundamentals of Innovation and Entrepreneurship" and "Innovative

Practice in Professional Fields," ensuring that innovation and entrepreneurship education is embedded throughout the entire professional teaching process. These courses emphasize the development of innovative thinking, entrepreneurial mindset, and practical problem-solving skills, tailored to the demands of various industries and emerging technologies.

In terms of practical platforms, the university has established multiple industry-academia cooperation bases, such as the "Shenzhen Vocational-Huawei ICT Innovation College" and the "Shenzhen Vocational-Tencent Cloud Innovation and Entrepreneurship Base." These platforms provide students with real-world project experience, bridging the gap between academic learning and industrial practice. Students engage in activities including product prototyping, market analysis, digital platform development, and collaborative research, thereby gaining hands-on skills and professional competencies essential for high-quality employment.

The service system is anchored by the Innovation and Entrepreneurship College, which offers a one-stop support structure including policy consultation, project incubation, financing connections, mentorship programs, and entrepreneurship competitions. This comprehensive support ensures that students receive guidance at every stage of their innovation and entrepreneurial journey—from ideation to project implementation and market launch—enhancing both the scope and impact of educational interventions.

5.2. Results Achieved

Over three years of implementation, Shenzhen Vocational and Technical University has achieved significant outcomes in fostering student innovation and entrepreneurship. Student-led startup projects have grown by an average of 40% annually, with multiple ventures reaching valuations exceeding 10 million yuan, demonstrating the scalability and economic impact of the university's educational model. Graduate employment rates remain consistently high, with initial employment exceeding 98%, and approximately 85% of graduates securing positions aligned with their majors, indicating a strong connection between educational training and labor market needs.

In collaboration with industry partners, the university has co-developed 32 specialized courses tailored to sector-specific innovation and entrepreneurship demands, fostering close alignment between academic content and professional requirements. Additionally, 56 patents have been jointly filed through student-enterprise research initiatives, reflecting the institution's emphasis on practical innovation and intellectual property development.

Beyond quantitative achievements, the university has established replicable and scalable innovation education experiences, including structured mentorship programs, modular project-based courses, and integrated service platforms. These practices provide a valuable reference for other vocational institutions seeking to strengthen innovation and entrepreneurship education and demonstrate the tangible benefits of aligning educational design with high-quality employment objectives.

6. Conclusion

Guided by the orientation of high-quality employment, vocational undergraduate institutions must adopt a holistic approach to enhance the effectiveness of innovation and entrepreneurship education. This requires systematic curriculum restructuring that integrates foundational theories, professional applications, and hands-on practice, coupled with the optimization of practical teaching platforms to cultivate students' problem-solving abilities and real-world competencies. Deepened school-enterprise collaboration is essential to ensure that educational programs remain closely aligned with industry needs, while a robust and diversified evaluation system is crucial for measuring

innovation, entrepreneurial practice, and employment outcomes, thereby supporting continuous improvement.

Empirical evidence demonstrates that only by embedding innovation and entrepreneurship education within professional training and precisely aligning it with labor market demands can institutions cultivate highly skilled applied talents who possess innovative thinking, entrepreneurial capabilities, and practical skills. These integrated efforts not only enhance students' employability and competitiveness but also foster a culture of innovation that contributes to the sustainable development of industries and society.

Looking ahead, as industrial upgrading and technological transformation accelerate, vocational undergraduate institutions should further strengthen industry-education integration, innovate pedagogical models, and construct a comprehensive innovation and entrepreneurship ecosystem that supports experiential learning, project-based practice, and interdisciplinary collaboration. Additionally, establishing mechanisms for long-term tracking, systematic evaluation, and feedback on education outcomes will enable institutions to continuously refine teaching strategies, ensure alignment with evolving market demands, and promote the high-quality development of vocational undergraduate education. Ultimately, such measures will provide a solid foundation for achieving high-quality employment, nurturing innovative talent, and contributing to broader socioeconomic progress.

References

1. L. Sun, "Do entrepreneurship education activities have an impact on entrepreneurial behavior? An application of behavioral entrepreneurial intention," *Environmental Science and Pollution Research*, vol. 30, no. 54, pp. 115855-115869, 2023. doi: 10.1007/s11356-023-30015-8
2. Y. Yang, "Research on the Barriers to Vocational Education's Industry-Education Integration Based on the Supply-Demand Mismatch,"
3. Y. Qu, "Teaching sustainable employability: Examining the factor structure of the perception of career development inventory for Chinese college students," *Sustainability*, vol. 15, no. 11, p. 9049, 2023. doi: 10.3390/su15119049
4. Z. Xiuyu, and Y. M. Yusof, "A Literature Review on Factors Influencing Employability Among College Students' Readiness in The Private University Hainan," *JOURNAL OF MANAGEMENT*, vol. 3, no. 2, 2024. doi: 10.38198/jms/3.2.2024.15
5. W. Hu, "Research on the Employment Situation, Bottleneck and Countermeasures of Graduates with Employment Difficulties in Higher Vocational Colleges," *Journal of Higher Vocational Education (ISSN: 3005-5784)*, vol. 1, no. 4, p. 25, 2024.

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