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Exploration of the Bidirectional Driving Path of Innovation and Entrepreneurship Education and New Quality Productivity in Higher Vocational Colleges

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Abstract:
Innovation and entrepreneurship education in higher vocational colleges is an important approach for cultivating innovative technical and skilled talents, and it provides human resources for the development of new quality productivity;The new quality productive forces, as a new form of productivity, can facilitate the reform and upgrading of innovation and entrepreneurship education. Therefore, there exists a two-way driving relationship between them. Exploring the specific pathways to achieve this two-way driving relationship can provide valuable references for higher vocational colleges to cultivate talents in innovation and entrepreneurship education that align with the development demands of new quality productive forces.

Key words:
Higher vocational colleges, Innovation and entrepreneurship education, New quality productivity, two-way drive

1.Introduction

Innovation is the primary driving force for development and the core element for the development of new quality productive forces.The 2025 government work report pointed that China's innovation capacity has been further enhanced, and new achievements have been made in fields such as integrated circuits, artificial intelligence, and quantum technology in the past year. The achievements of innovation-driven development continue to emerge. The new quality of productive forces with innovation at its core is serving as a key driving force for the high-quality development of China's economy.Innovation and entrepreneurship education in higher vocational colleges is an important way to cultivate innovative technical and skilled talents. In recent years, although higher vocational colleges in China have achieved certain results in innovation and entrepreneurship education, they still face practical predicaments such as insufficient industry-education collaboration and lagging teaching paradigms. Especially in the face of the development requirements of new quality productive forces, how can innovation and entrepreneurship education in higher vocational colleges break through the predicament and cultivate new quality talents?It is of great significance for vocational education

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and the high-quality development of the social economy.Based on this, through in-depth exploration of the bidirectional driving relationship between innovation and entrepreneurship education in higher vocational colleges and new quality productivity, provides references for further improving the theoretical system of innovation and entrepreneurship education in vocational colleges and establishing a long-term mechanism for the coordinated development of education and industry, so that vocational education can truly serve the construction of a modern industrial system.

2.Theoretical Logic

Innovation and entrepreneurship education, along with new productive forces, are mutually reinforcing. Innovation and entrepreneurship education fosters the development of new productive forces by cultivating innovative talents, stimulating innovative thinking, and facilitating the transformation of scientific and technological achievements. In turn, new productive forces, through their demand for talent, resource supply, and environmental shaping, drive the updating of educational philosophies, the restructuring of the education system, the promotion of personalized learning, and the diversification and differentiation of talent cultivation models. The theoretical framework for this process is rooted in systems theory and synergy theory.

2.1. Coupled symbiosis from the perspective of system theory

Systems theory is a discipline that focuses on the structure, characteristics, and laws of research objects and their interconnections. Its core principle is to view the research object as a whole. Coupled symbiosis refers to the mutual promotion and co-development among systems. From the perspective of systems theory, innovation and entrepreneurship education and new productive forces have a coupled symbiotic relationship. First, both innovation and entrepreneurship education and the development of new productive forces aim to promote industrial development. Innovation and entrepreneurship education can cultivate innovative talents that meet the needs of new productive forces, thus providing talent support for their development. The development of new productive forces promotes the deep transformation and upgrading of industries, achieving economic structure optimization and efficiency transformation. The alignment in their goals encourages mutual promotion and common development. Second, they complement each other's resources. Innovation and entrepreneurship education provides talent and knowledge resources, while the development of new productive forces offers practical opportunities and industrial resources for education. Schools enhance students' practical skills by providing more practical opportunities through school-enterprise cooperation. Meanwhile, enterprises can drive industrial development through technological innovation by leveraging the research capabilities of universities.

2.2. Value co-creation of multiple subjects from the perspective of synergy theory

According to the theory of synergy, "despite their varying attributes, different systems within the same environment interact and cooperate with each other." This theory is particularly applicable to systems composed of multiple interconnected, complex, and open subsystems. The bidirectional relationship between innovation and entrepreneurship education in higher vocational colleges and new productive forces forms a complex network involving multiple stakeholders and multi-level interactions, which aligns well with the characteristics of research subjects as defined by the theory of synergy.

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In terms of goal coordination, it is reflected in the dynamic alignment between educational supply and industrial demand. The aim of vocational education is to cultivate technical and skilled talents. The development of new productive forces has driven vocational education goals to shift from single-skilled talents to innovative and digital-intelligent composite talents. This requires innovation and entrepreneurship education to establish a comprehensive capability training system that includes innovative thinking, digital-intelligent literacy, and ecological awareness, ensuring precise alignment between talent specifications and industrial upgrades. Second, in terms of mechanism coordination, it is reflected in the construction of a symbiotic ecosystem involving multiple stakeholders. For example, industry colleges, as a new mechanism for integrating industry and education, were established to meet the needs of 'innovation and entrepreneurship' education in universities and the development of enterprises. To further develop, enterprises need to expand resources, optimize structures, and enhance market influence. University 'innovation and entrepreneurship' education must adapt to the new development environment by collaborating with high-quality enterprises, integrating 'government-university-enterprise' resources, and forming a closed-loop ecosystem of 'industry empowering education—education cultivating talents—talents supporting industry.' Finally, in terms of efficiency coordination, it is reflected in the mutual nourishment of innovation vitality and productivity enhancement. Innovation and entrepreneurship education, through various entrepreneurial competitions, can directly incubate technological achievements and convert them into productive elements. For example, various college student innovation and entrepreneurship competitions and their derivative outcomes serve as micro-carriers for new productive forces technology innovation, further promoting the cultivation of innovative talents.

3.Real Dilemmas

The bidirectional drive between innovation and entrepreneurship education in higher vocational colleges and new productive forces is characterized by education empowering productivity, which in turn supports education. However, the mismatch between education and social productivity poses practical challenges to this bidirectional drive. Specifically, the educational efforts to empower new productive forces are insufficient, and the positive impact of these new productive forces on vocational college innovation and entrepreneurship education is limited.

3.1. The way of personnel training is difficult to meet the needs of the development of new productive forces

The educational philosophy is outdated. Currently, the innovation and entrepreneurship education in higher vocational colleges still focuses primarily on theoretical knowledge, lacking the cultivation of students 'critical thinking and creative problem-solving skills. In terms of curriculum design, the pace of course updates is slow, failing to keep up with the latest technological trends in emerging industries, particularly in areas like artificial intelligence and the Internet of Things. This results in a mismatch between students' skill sets and the practical demands of new productive forces, such as 'highly intelligent labor tools' and 'digital production environments.' The content of textbooks has not been updated to reflect the latest technologies, leading to outdated teaching cases. Some institutions still hold the mindset of 'emphasizing skills over innovation,' treating innovation and entrepreneurship education as an auxiliary module rather than integrating it into the entire talent development process.

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3.2. There are structural contradictions in the teaching staff

The structural issues in the faculty of innovation and entrepreneurship education at higher vocational colleges are evident in both the shortage of teachers and the uneven quality. In terms of quantity, there is an imbalance in the ratio of teachers to students. As a general education course, innovation and entrepreneurship education has a high demand for instructors, but the number of full-time teachers is limited, making it difficult to meet the demand. In terms of quality, on one hand, the proportion of 'dual-qualified' teachers is low, and there is a lack of teachers with industry experience, especially in emerging industries, where there is a shortage of composite talents who are both technically proficient and capable of teaching. On the other hand, most instructors are part-time, such as professional teachers and ideological and political counselors, which results in a lack of stability and continuity in the faculty.

3.3. Insufficient platform support

The lack of support for innovation and entrepreneurship education platforms in higher vocational colleges is evident in the scarcity of practical platforms, the inadequacy of information sharing platforms, and the absence of industry-university-research integration cooperation platforms. While innovation and entrepreneurship practice platforms have seen some development with policy, technical, and resource support, their scale remains limited. Although most schools have established innovation labs and makerspaces, these facilities are underutilized; off-campus practice bases often serve as mere formalities and are not effectively utilized for innovation and entrepreneurship education. With the advancement of new productive forces, innovation and entrepreneurship education, supported by new technologies, is gradually breaking down spatial and temporal barriers, and the scope of information access is expanding. However, due to the inadequacy of sharing platforms, information sharing is hindered, limiting the exchange of information among students, teachers, and enterprises. This makes it difficult for students to stay updated on market trends and industry needs, thereby affecting the relevance and feasibility of innovation and entrepreneurship projects.

4.Implementation path

The realization path of bidirectional driving between innovation and entrepreneurship education and new quality productivity in higher vocational colleges can be explored from two aspects: how innovation and entrepreneurship education in higher vocational colleges can empower new quality productivity, and how new quality productivity can feed back to innovation and entrepreneurship education in higher vocational colleges. The details are shown in the following figure:

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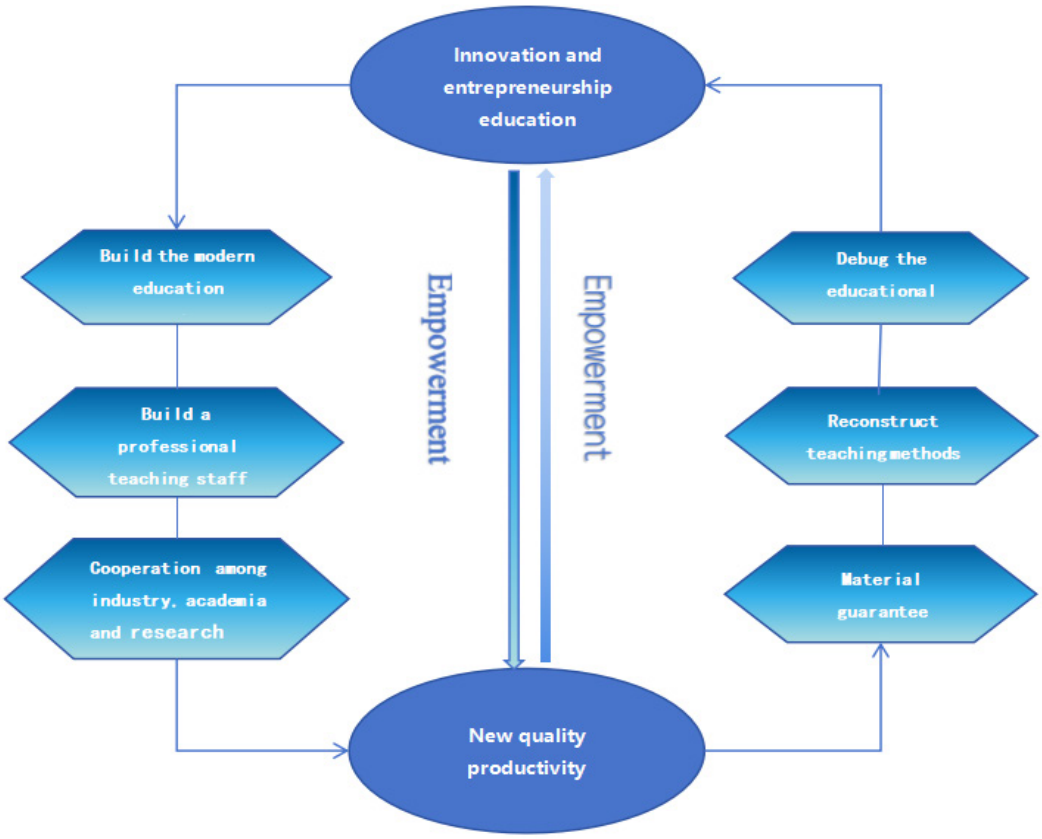


Figure 1 Two-way driving path of innovation and entrepreneurship education and new quality productivity

4.1. Innovation and entrepreneurship education in higher vocational colleges provides talent support and innovation power for the development of new quality productive forces

Education is an indispensable force for empowering the development of new productive forces. By building a modern education system, forming a professional teaching staff, and enhancing industry-university-research collaboration, higher vocational colleges and institutions of higher learning can improve the quality of talent cultivation in innovation and entrepreneurship education, effectively promote scientific and technological innovation, and focus on advancing the development of new productive forces.

First,build a modern education system to provide talent support for the development of new productive forces.

To build a modern education system that integrates education, science and technology, and talent, it is essential to adopt a systemic approach, emphasizing cross-disciplinary integration and dynamic interaction mechanisms. First, the curriculum design should be optimized. By creating an interdisciplinary and integrated curriculum, cutting-edge technologies such as artificial intelligence, big data, and biotechnology can be integrated into the course content. For instance, in 2025 during the Spring Festival, the domestic large model launched by China's AI enterprise DeepSeek amazed the world with its high performance, achieving significant results with minimal resources. In response, Zhejiang University introduced an AI general education course, attracting nearly 3,000 students across 58 classes. This not only broke the traditional teaching model

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but also built an open, dynamic, and sustainable educational ecosystem, providing strong support for cultivating innovative talents who can adapt to future industrial changes. Second, the practical orientation should be strengthened by adding case studies, project practices, and internships in enterprises, forming a talent development path centered on innovation and practical skills. Third, the evaluation system should be optimized. While inheriting traditional evaluation content, it should incorporate the requirements of new productive forces, specifically by evaluating students' application of innovative thinking and skills, as well as the evaluators' use of new technologies such as artificial intelligence and big data. This will form a more comprehensive evaluation framework through digital and intelligent technology, enhancing the timeliness and flexibility of evaluations.

Second, build a professional teaching team to provide team guarantee for the training of new quality talents.

The faculty is a crucial guarantee for the high-quality development of education. To build a professional teaching team, we need to optimize the faculty structure and strengthen the integration of school-enterprise collaboration. We should leverage the advantages of the external teacher system by recruiting enterprise engineers and technical experts with practical industry experience as part-time teachers, bringing the most advanced technology and concepts from enterprises into schools and classrooms. We should also focus on cultivating 'dual-qualified' teachers, using school-enterprise cooperation as a link to regularly organize teachers to participate in enterprise R&D and production management, jointly design and implement project-based teaching, and promote the seamless connection between teaching and production scenarios. Secondly, we need to improve the evaluation system and incentive mechanisms by setting up awards for industrial contributions or innovative talent cultivation, incorporating the results of technology transfer and the effectiveness of student entrepreneurship projects into the title review and personal performance evaluation. Thirdly, we should establish teacher innovation teams, organizing these teams to undertake enterprise technology breakthrough projects, thereby enhancing teachers' ability in innovation and entrepreneurship education through practical experience.

Third, strengthen cooperation between enterprises, universities and research institutes, promote the commercialization of scientific and technological achievements, and gather innovative impetus for new productive forces.

To enhance the collaboration among industry, academia, and research in innovation and entrepreneurship education at universities, it is essential to promote this through policy guidance, mechanism innovation, platform co-construction, and resource integration. At the policy level, it is crucial to implement financial support policies for college students 'innovation and entrepreneurship, providing them with information services, policy consultations, project development, and legal assistance to reduce entrepreneurial risks. In terms of mechanism innovation, efforts should be made to deepen the integration of industry and education by establishing a mechanism that aligns with industrial needs. This involves collaborating with government departments and enterprises to publish demand lists, using a' call for heroes 'approach to drive targeted breakthroughs in key technologies by research innovation teams, thereby facilitating the transformation and implementation of research outcomes. In platform construction, a collaborative governance model involving government, universities, and enterprises should be adopted, with local governments taking the lead in establishing industry

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colleges co-built by universities and enterprises. This will facilitate the deep integration of industry and education resources, forming a value chain loop from' technology research and development to technology transfer to commercial application.'

4.2. New productive forces enable the innovation and entrepreneurship education concept innovation and method reconstruction of higher vocational colleges

The new quality productivity not only injects new momentum into economic development, but also provides unprecedented opportunities for innovation and entrepreneurship education in higher vocational colleges. These opportunities are manifested in three aspects: concept innovation, method reconstruction and capital guarantee.

First, dynamic adjustment of educational concepts

The new quality of productive forces drives the innovation and entrepreneurship education in higher vocational colleges, which is reflected in the reshaping of educational goals and the restructuring of teaching philosophies. In terms of educational goals, the focus has shifted from the simple transmission of traditional subject knowledge to the development of cross-disciplinary integration skills, forming a three-dimensional capability matrix that includes professional skills, digital literacy, and entrepreneurial thinking. Regarding teaching philosophy, it leverages new productive forces such as artificial intelligence and industrial internet to create a closed-loop teaching model that integrates project-driven learning, virtual simulation practice, and intelligent diagnostic feedback. This restructuring essentially achieves a digital coupling between educational training and corporate innovation, fostering a new ecosystem for innovation and entrepreneurship education that adapts to the development of new productive forces. This is achieved through the integration of industry and education, the establishment of data sharing platforms between schools and enterprises, and the creation of entrepreneurship incubators.

Second, digital and intelligent reconstruction of teaching methods

The new productive forces empower innovation and entrepreneurship education by leveraging technological advantages to innovate educational methods comprehensively, including theoretical learning, practical operations, and course evaluation. Firstly, in theoretical learning, personalized learning pathways are established. Teachers use artificial intelligence technology to conduct teaching through online and offline methods, integrating students 'learning data to analyze their interests and difficulties, and providing targeted learning resources and academic guidance to meet the diverse needs of students. Secondly, in practical operations, a virtual simulation practice platform is set up. This platform simulates real entrepreneurial scenarios, offering students an immersive entrepreneurial experience and reducing practical costs and risks. Thirdly, in course evaluation, an intelligent evaluation system is constructed. Teachers use big data technology to build an intelligent evaluation system for students' learning outcomes, enabling real-time, comprehensive, and precise monitoring of students' learning processes and achievements, thus providing data support for teaching reforms.

Third, material guarantee for educational practice

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Strong financial support not only provides teachers with the confidence to conduct innovation and entrepreneurship education but also ensures that students 'innovative ideas and entrepreneurial projects can be realized. The development of new productive forces has led to the emergence of new business models and financing methods, which in turn provide financial backing for innovation and entrepreneurship education in higher vocational colleges. Firstly, it attracts venture capital to student entrepreneurial projects. The rise of new productive forces has resulted in a large number of high-growth enterprises, such as the' Hangzhou Six Dragons, 'which have attracted more attention from venture capital firms to the technology itself, laying a solid foundation for the implementation of students' innovation and entrepreneurship projects. Secondly, crowdfunding platforms have lowered the financing threshold. Crowdfunding platforms, driven by the Internet, can gather social funds to support students 'innovation and entrepreneurship projects, reduce the financing threshold, and safeguard students' entrepreneurial practices.

5.Conclusion

The bidirectional driving relationship between innovation and entrepreneurship education in higher vocational colleges and new productive forces is theoretically based on systems theory and synergy theory. This relationship is formed through goal coordination, resource complementarity, and mechanism linkage, creating a symbiotic coupling. Innovation and entrepreneurship education fosters the development of new productive forces by cultivating innovative talents and promoting technology transfer. In turn, new productive forces drive the upgrade of the education system through technological empowerment, conceptual innovation, and resource feedback. However, due to the lag in talent cultivation models compared to industry needs, imbalances in faculty structure, and deficiencies in practical platforms and industry-university-research collaboration mechanisms, achieving this bidirectional driving relationship presents practical challenges. To address these issues, the article explores three aspects: building a modern education system, creating a professional faculty team, and strengthening industry-university-research collaboration. These efforts aim to provide talent support and innovation momentum for the development of new productive forces through innovation and entrepreneurship education in higher vocational colleges. Additionally, the article explores how new productive forces can empower innovation and entrepreneurship education in higher vocational colleges through dynamic adjustments to educational concepts, digital and intelligent reconstructions of teaching methods, and material guarantees for educational practices, thereby clarifying the path to achieving the bidirectional driving relationship between innovation and entrepreneurship education and new productive forces in higher vocational colleges.

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