

Research on the Deepening of Mass Entrepreneurship and Innovation Education in Higher Vocational Colleges and the Practical Path of Industry-Education Integration in the New Era

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Abstract: The integration of industry and education provides intrinsic support for the construction of a collaborative education system between higher vocational colleges and enterprises. Based on the integration of industry and education, higher vocational colleges develop mass entrepreneurship and innovation education, which also requires the establishment of systems and institutions for mass entrepreneurship and innovation education to internally support the steady progress of the integration of industry and education. By clarifying the new demands for mass entrepreneurship and innovation education and the integration of industry and education in the new era, while further strengthening balanced development layouts, identifying practical educational issues in mass entrepreneurship and innovation education and the integration of industry and education, and formulating scientific practical strategies, this study expands the new development path of deepening mass entrepreneurship and innovation education and the integration of industry and education in higher vocational colleges, providing educational support for the coordinated advancement of mass entrepreneurship and innovation education and the integration of industry and education in higher vocational colleges.

Keywords: Higher vocational colleges; Mass entrepreneurship and innovation education; Integration of industry and education; Practical path

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1. Introduction

Currently, the steady advancement of mass entrepreneurship and innovation education for professional talents provides multifaceted educational support for the development of the integration of industry and education in

higher vocational colleges. Building on the educational layout of integration of industry and education based on the system construction of mass entrepreneurship and innovation education, it is essential to scientifically address educational alignment and design in accordance with the current needs for cultivating talents in mass entrepreneurship and innovation, and the educational planning for the integration of industry and education. This ensures the continuous strengthening of coordinated advancement of mass entrepreneurship and innovation education and the integration of industry and education, facilitating the transformation of talent development outcomes in higher vocational colleges. This foundation solidifies the high-quality progression of mass entrepreneurship and innovation education and the integration of industry and education in higher vocational colleges.

2. Requirements and background of deepening mass entrepreneurship and innovation education integration of industry and education in higher vocational colleges in the new era

In July 2019, the Ministry of Education of the People's Republic of China printed and distributed a notice on the *Management Measures for the National Undergraduate Innovation and Entrepreneurship Training Program*, clearly stating, "Key support is provided for training and practical projects directly targeting college students that are novel in content, clearly defined in objectives, demonstrate a certain level of creativity and exploratory nature, and have innovative technology or business models. The National Innovation Program adopts a project-based management approach, categorized into three types^[1,2]: innovation training projects, entrepreneurship training projects, and entrepreneurship practice projects." Enhancing the practical training capabilities of college students in mass entrepreneurship and innovation education and providing support for students by offering position-specific practical training, entrepreneurship practical training, and development training based on commercial development will be key factors in advancing the construction of the mass entrepreneurship and innovation education system^[3]. In this regard, efforts should focus on exploring educational practical training resources for college students, including establishing a practical training support system, enhancing practical training service capabilities, and improving the specificity of practical training, to support the development of college students in mass entrepreneurship and innovation. After years of construction and development, China's mass entrepreneurship and innovation education for university students has begun to show initial results. By constructing a diverse integrated education system with mass entrepreneurship and innovation education as the mainstay, significant support has been provided for the cultivation of mass entrepreneurship and innovation talents. To better maintain the positive momentum of education in mass entrepreneurship and innovation and achieve steady and incremental progress in mass entrepreneurship and innovation education, in December 2023, the Ministry of Education of the People's Republic of China issued a *Notice Regarding the 2024 National General Higher Education Graduates Employment and Entrepreneurship Work*. The notice actively encourages and supports university graduates to start their businesses independently, implementing entrepreneurship support policies, and providing tender support to graduate entrepreneurs in terms of funding, premises, and other aspects, to provide services for university graduates in innovation, entrepreneurship incubation, and outcome transformation. Based on the requirements of the Ministry of Education of the People's Republic of China for the employment and entrepreneurship of general higher education graduates, higher vocational colleges should adhere to practical exploration of new thoughts, utilize new carriers such as the creative economy, digital economy, and platform economy, and continuously improve the system for education mass entrepreneurship and innovation talents, laying a solid foundation for talents from vocational colleges to better integrate into

the development environment of mass entrepreneurship and innovation in the new era. Integration of industry and education, as a scientific measure to deepen cooperation between universities and enterprises in education, further aligns with the new requirements for cultivating mass entrepreneurship and innovation talents in the new era ^[4]. Relying on enterprise development platforms, industry innovation platforms, and technology research and development platforms, enhancing the resource supply for mass entrepreneurship and innovation education, enriching the structure, content, and education system of mass entrepreneurship and innovation education, and establishing a multi-path collaborative educational model based on a multi-pronged educational approach will be key to improving the quality of mass entrepreneurship and innovation education in universities. Simultaneously, effectively utilizing practical training and educational guidance in mass entrepreneurship and innovation education to contribute to the development of integration of industry and education, enabling the utilization of resources from mass entrepreneurship and innovation education to strengthen educational cooperation with enterprises, is crucial. Consequently, the higher vocational colleges' mass entrepreneurship and innovation education and integration of industry and education can achieve a two-way complement. Therefore, the deepening of the integration of industry and education through mass entrepreneurship and innovation education in higher vocational colleges is essentially based on a system of balanced development. This fosters a close connection between the integration of industry and education and mass entrepreneurship and innovation education, enhancing mutual educational support between the two and altering the educational landscape where integration of industry and education and mass entrepreneurship and innovation education operate in isolation. This empowers mass entrepreneurship and innovation education to provide a stronger internal driving force for education and development under the integration of industry and education.

3. Internal support for the deepening of mass entrepreneurship and innovation education and the integration of industry and education in higher vocational colleges in the new era

3.1. Collaborative education platform

The collaborative education platform serves as a crucial internal support for the deepening of the integration of industry and education in mass entrepreneurship and innovation education. The advancement of mass entrepreneurship and innovation education in higher vocational colleges should rely on educational channels for the integration of industry and education to ensure educational alignment. By continuously strengthening educational permeation and practical training in mass entrepreneurship and innovation, enhancing students' accumulation of experiences in innovation and entrepreneurship, and expanding students' new perspectives on innovation and entrepreneurship development, higher vocational colleges can broaden their horizons. Relying on the support provided by enterprises for mass entrepreneurship and innovation education in higher vocational education continuously enhances students' comprehensive development capabilities in mass entrepreneurship and innovation and bridges inherent differences in cultivating mass entrepreneurship and innovation talents in the new era. This supplements the practical content of mass entrepreneurship and innovation education, establishes a dual-integrated online and offline channel for practical mass entrepreneurship and innovation, and enables higher vocational colleges to utilize integration of industry and education to effectively develop the mass entrepreneurship and innovation education system, embedding mass entrepreneurship and innovation education into various aspects of integration of industry and education ^[5]. Therefore, the construction of the collaborative education platform creates favorable conditions for the deepening development of integration of industry and education in mass entrepreneurship and innovation education in higher vocational colleges,

enabling complementary content and structural integration between mass entrepreneurship and innovation education and integration of industry and education, thereby solidifying the foundation for the long-term advancement of integration of industry and education and mass entrepreneurship and innovation education in higher vocational colleges.

3.2. Practical training systems in mass entrepreneurship and innovation education

Deepening the practice of integrating mass entrepreneurship and innovation education into industry and education requires focusing on the cultivation of mass entrepreneurship and innovation talents as the core of exploring education under the integration of industry and education. Applying the education model of integration of industry and education to the cultivation of mass entrepreneurship and innovation talents, and utilizing integration of industry and education in the practical aspects of mass entrepreneurship and innovation education for the transformation of educational outcomes are necessary. Therefore, higher vocational colleges should rely on the practical training system construction of the integration of industry and education to provide practical training support for mass entrepreneurship and innovation education. By enhancing the practical training capabilities and educational guidance of mass entrepreneurship and innovation education and strengthening the feedback of practical training in mass entrepreneurship and innovation education to address educational issues and demands under integration of industry and education, higher vocational colleges can judiciously adjust the educational structure and planning of integration of industry and education and provide diverse information references for the educational design of integration of industry and education across various disciplines ^[6]. This allows higher vocational colleges to better advance the practical training of integration of industry and education based on mass entrepreneurship and innovation education. Therefore, the construction of the system for practical training in mass entrepreneurship and innovation education is essentially providing educational support for enhancing the education mechanism under integration of industry and education, enabling higher vocational colleges to continuously optimize educational thoughts of integration of industry and education while enhancing the quality of mass entrepreneurship and innovation education, laying a solid foundation for the future advancement of integration of industry and education within higher vocational colleges.

4. Dilemmas of higher vocational colleges in deepening the integration of industry and education by relying on mass entrepreneurship and innovation education

4.1. Lack of a close connection between mass entrepreneurship and innovation education in higher vocational colleges and the integration of industry and education

Ensuring the close connection between mass entrepreneurship and innovation education and the integration of industry and education involves applying the concepts, educational content, and resources of mass entrepreneurship and innovation education to the educational practices of integration of industry and education. This further enhances the top-level design of the integration of industry and education, serving as a focal point for deepening the integration of mass entrepreneurship and innovation education into this framework. Some higher vocational colleges' collaborative system constructions for mass entrepreneurship and innovation education and integration of industry and education focus solely on educational layouts within singular fields, failing to adequately create space for the deepening integration of mass entrepreneurship and innovation education into integration of industry and education, thus preventing a close connection between the two. For instance, some higher vocational colleges' constructions of mass entrepreneurship and innovation education systems concentrate solely on reinforcing students' knowledge reserves in innovation and entrepreneurship

without properly addressing the practical training needs for mass entrepreneurship and innovation talents, hindering effective educational connections towards the integration of industry and education. This limitation makes it difficult for the integration of industry and education's educational practical training with enterprises to tailor educational designs specifically for mass entrepreneurship and innovation education, thereby impeding the collaborative advancement of mass entrepreneurship and innovation education and integration of industry and education ^[7]. From the perspective of education under the integration of industry and education, the reality of inadequate practical guidance abilities in mass entrepreneurship and innovation education leads to university students struggling to effectively link the content of mass entrepreneurship and innovation knowledge, disciplinary subjects, and positional practical training. This exacerbates the fragmented learning of mass entrepreneurship and innovation knowledge and practical skills among university students, rendering the deepening integration of mass entrepreneurship and innovation education into the integration of industry and education a mere rhetoric.

4.2. Unreasonable allocation of educational resources for mass entrepreneurship and innovation education and integration of industry and education in higher vocational colleges

In order to deepen the integration of mass entrepreneurship and innovation education into the integration of industry and education development, it should be based on the construction of a cross-fusion system, reasonably allocating educational resources to ensure that mass entrepreneurship and innovation education and the integration of industry and education complement and support each other. However, some higher vocational colleges have not fully leveraged the complementary advantages of resources for effective educational guidance. Instead, these higher vocational colleges have resorted to a crude and simplistic overlapping structure, directly applying the content of mass entrepreneurship and innovation education to the educational practices of integration of industry and education, thereby hindering students from effectively digesting and absorbing the content and knowledge of mass entrepreneurship and innovation education. The primary reason behind this issue lies in the failure of higher vocational colleges to conduct a comprehensive educational assessment of resource allocation, leading to a lack of understanding regarding the application needs of educational resources for mass entrepreneurship and innovation education and integration of industry and education, thereby keeping mass entrepreneurship and innovation education consistently outside the education system of integration of industry and education ^[8]. Integration of industry and education also struggles to provide diversified practical training support for mass entrepreneurship and innovation education. Additionally, some higher vocational colleges overly emphasize phased educational outcomes in curriculum design, neglecting control over educational details and processes. This oversight results in a lack of educational direction and purpose in the utilization of educational resources for mass entrepreneurship and innovation education and integration of industry and education, which hampers the steady progress of higher vocational colleges' mass entrepreneurship and innovation education and integration of industry and education. Consequently, the advancement of mass entrepreneurship and innovation education in higher vocational colleges is destined to fall short in providing support for the integration of industry and education.

4.3. Insufficient educational leadership capacity in enterprises' mass entrepreneurship and innovation education and integration of industry and education

Currently, the system construction of mass entrepreneurship and innovation education in higher vocational colleges primarily focuses on enhancing students' vocational development capabilities, emphasizing the

improvement of teachers' educational abilities, and strengthening the cultivation of students' practical training abilities in a certain aspect of education design. In practice, however, insufficient attention has been given to the system construction of mass entrepreneurship and innovation education, leading to the inability of higher vocational colleges to achieve an educational cycle between mass entrepreneurship and innovation education and the integration of industry and education. The core influencing factors that lead to this issue in higher vocational colleges are twofold. Firstly, higher vocational colleges have not strengthened the educational leadership capacity of enterprises, causing a lack of understanding by enterprises regarding the educational goals and positioning of higher vocational colleges, thus making it difficult to utilize enterprise resources to provide targeted educational support for the integration of industry and education or mass entrepreneurship and innovation education. Secondly, higher vocational colleges have failed to effectively control the teaching pace of mass entrepreneurship and innovation education and the integration of industry and education, resulting in challenges in connecting the teaching and practical training of mass entrepreneurship and innovation education with current industry trends, entrepreneurship policies, and enterprise manpower needs in a systematic manner. Consequently, the collaborative education efforts between higher vocational colleges' mass entrepreneurship and innovation education and the integration of industry and education lose practical significance. Therefore, the insufficient educational leadership capacity of enterprises and the ineffective control of educational pace by higher vocational colleges diminish the quality of student education, restricting the deepening of mass entrepreneurship and innovation education within the integration of industry and education development solely to educational connections within the campus environment, impeding the effective cross-fusion of educational cultivation tailored towards enterprise practical training. Ultimately, this dilemma results in the collaborative student education efforts between higher vocational colleges' mass entrepreneurship and innovation education and the integration of industry and education facing significant challenges in educational development.

5. Practical paths for deepening the integration of industry and education based on mass entrepreneurship and innovation education in higher vocational colleges

5.1. Constructing a diversified collaborative practice system for mass entrepreneurship and innovation education and integration of industry and education

Constructing a diversified collaborative practice system for mass entrepreneurship and innovation education and integration of industry and education requires higher vocational colleges to perfect the educational content, programs, and practical modules during the formulation of mass entrepreneurship and innovation education planning. The higher vocational colleges should systematically lay out the practice of mass entrepreneurship and innovation education based on the innovative entrepreneurship development needs of students in different disciplines. This creates educational space for education under the integration of industry and education, enabling the integration of mass entrepreneurship and innovation education content with various disciplinary knowledge to ensure that students can strengthen the alignment of educational content between mass entrepreneurship and innovation education and the integration of industry and education. For instance, in the practical layout of mass entrepreneurship and innovation education, higher vocational colleges should adjust educational plans according to the diverse practical training projects in each professional field of integration of industry and education. The higher vocational colleges should seamlessly integrate mass entrepreneurship and innovation education practical content closely related to professional practical training into the current educational practice system and provide support for students' learning and practical application of mass entrepreneurship and innovation knowledge. When necessary, higher vocational colleges can incorporate

certain elements of mass entrepreneurship and innovation education into integration of industry and education, allowing students to understand enterprise operational models, development strategies, and various job responsibilities through practical training, thus helping students validate mass entrepreneurship and innovation course knowledge during the practical training within integration of industry and education. This approach enables mass entrepreneurship and innovation education to penetrate education, with a focus on the integration of industry and education. Integration of industry and education can also serve as an educational practical training platform for mass entrepreneurship and innovation education, enhancing the collaborative educational capabilities between higher vocational colleges' mass entrepreneurship and innovation education and integration of industry and education. This consolidates the foundation for the enhancement of the closer integration between mass entrepreneurship and innovation education in higher vocational colleges and industry-education integration.

5.2. Deepening the educational layout of integration of industry and education in higher vocational colleges' project practical training

Deepening the educational layout of integration of industry and education in project practical training at higher vocational colleges refers to optimizing the allocation scheme of educational resources for mass entrepreneurship and innovation education and integration of industry and education through vocational talents' practical training in enterprises. By addressing the bidirectional requirements of mass entrepreneurship and innovation education and the integration of industry and education through practical placements, effective balancing of educational resource allocation is achieved. This allows higher vocational colleges to adequately supply resources for mass entrepreneurship, innovation education, and integration of industry and education based on an assessment of educational needs. For example, higher vocational colleges can directly arrange rotational practical training for students through industry channels after completing phased learning tasks. This allows students to engage in rotational practical training in enterprises, participate in entrepreneurial projects or position practice projects, understand the needs of entrepreneurial initiatives and position innovations in companies, and enrich their experiences in innovative entrepreneurship development. Based on students' performance and the various learning and practical training issues observed during rotational practical training in enterprises, assessments are conducted for education under mass entrepreneurship and innovation education and integration of industry and education. This analysis identifies educational deficiencies in the collaborative education of mass entrepreneurship, innovation education, and the integration of industry and education in various aspects. Subsequently, based on the arrangement of follow-up educational tasks and the formulation of educational plans, different educational resource support is provided for mass entrepreneurship and innovation education and the integration of industry and education. This targeted application of educational resources effectively addresses education and training issues within mass entrepreneurship, innovation education, and the integration of industry and education. Vocational talents not only clarify their subsequent learning goals through project practical training but also provide teaching references in mass entrepreneurship and innovation education and integration of industry and education for teachers, helping them enhance the effective utilization of various teaching resources. This alignment ensures that higher vocational colleges' mass entrepreneurship and innovation education and integration of industry and education progress consistently. It enables mass entrepreneurship and innovation education to strategically position educational decisions according to the needs of integration of industry and education practical training and achieve coordinated education under mass entrepreneurship and innovation education and integration of industry and education.

5.3. Establishing an enterprise-led education model for mass entrepreneurship and innovation education and integration of industry and education

Establishing an enterprise-led education model for mass entrepreneurship and innovation education and integration of industry and education helps address the insufficient education leadership capabilities of enterprises in mass entrepreneurship and innovation education and integration of industry and education. Enterprise leadership refers to enterprises taking the lead in educational decision-making for the integration of industry and education, providing support in various aspects like teacher training, student practical training, and resource optimization for higher vocational colleges' mass entrepreneurship and innovation education. This involvement enables enterprises to participate in education and develop mass entrepreneurship and innovation education within higher vocational colleges. By guiding higher vocational colleges' mass entrepreneurship and innovation education development and educational decisions related to integration of industry and education, enterprises help empower higher vocational colleges to deepen mass entrepreneurship and innovation education within the framework of integration of industry and education, ultimately enhancing the quality of education in mass entrepreneurship and innovation education and integration of industry and education^[9]. For example, guided by enterprise-led mass entrepreneurship and innovation education service directives, providing teacher training support to higher vocational colleges can enhance teachers' understanding of current industry development trends, innovative entrepreneurship policies, and regional innovation and entrepreneurship requirements. This dynamic approach enables teachers to design education programs according to the specific needs of innovation and entrepreneurship development in different regions. Furthermore, enterprises can engage in the construction of educational platforms for education, allowing project leaders of relevant entrepreneurial initiatives or industry experts to participate in interactive practices within mass entrepreneurship and innovation education. Through relying on educational channels within the integration of industry and education, enterprises can support mass entrepreneurship and innovation education, focusing on enhancing the quality of practical experiences. This approach helps higher vocational colleges effectively integrate practical training within the integration of industry and education by utilizing mass entrepreneurship and innovation education, thereby applying subject-specific and foundational knowledge from the integration of industry and education to practical applications within mass entrepreneurship and innovation education. This multivariate cycle achieves a synergy between mass entrepreneurship and innovation education and integration of industry and education, elevating the quality of education provided by higher vocational colleges in mass entrepreneurship and innovation education and integration of industry and education. Additionally, establishing an enterprise-led education model for mass entrepreneurship and innovation education and integration of industry and education enables better management of educational pacing in higher vocational colleges. This strategic alignment ensures that higher vocational colleges can deliberately advance mass entrepreneurship and innovation education in line with enterprise entrepreneurial models and workforce demands, providing targeted support for the integration of industry and education to foster collaboration in education across various domains with enterprises.

6. Conclusion

In summary, in the new era, the deepening of the integration of industry and education within mass entrepreneurship and innovation education at higher vocational colleges will prioritize the cultivation of talent in mass entrepreneurship and innovation. This will involve enhancing the practical training capabilities in mass entrepreneurship and innovation education, fostering a closer connection between mass entrepreneurship and innovation education and integration of industry and education at higher vocational colleges. This

connection aims to enable mass entrepreneurship and innovation education to address the new demands in talent development of the current era more effectively, thereby better supporting the integration of industry and education. This will facilitate bi-directional coordination in the development of mass entrepreneurship and innovation education and the integration of industry and education at higher vocational colleges, enhancing the timeliness and specificity of education talent in mass entrepreneurship and innovation in the new era. These efforts will establish a solid foundation for higher vocational colleges to maintain a balanced development of mass entrepreneurship, innovation education, and integration of industry and education.

Disclosure statement

The author declares no conflict of interest.

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