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EXPLORATION OF A NEW PRACTICE MODEL FOR THE INTEGRATION OF INDUSTRY AND EDUCATION IN CHINESE VOCATIONAL EDUCATION - TAKING THE CONSTRUCTION OF "INDUSTRIAL COLLEGES" AS AN EXAMPLE

ANÁLISE DE UM NOVO MODELO DE PRÁTICA PARA A INTEGRAÇÃO ENTRE A INDÚSTRIA E A EDUCAÇÃO NO SISTEMA DE ENSINO PROFISSIONALIZANTE CHINÊS — TOMANDO COMO EXEMPLO A CRIAÇÃO DE "FACULDADES INDUSTRIAIS"

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Yanan Zhu*
***College of innovation and management, Suan Sunandha Rajabhat University, Bangkok, Thailand
258396218@qq.com

Chayanan Kerdpitak*
***College of innovation and management, Suan Sunandha Rajabhat University, Bangkok, Thailand
chayanan.ke@ssru.ac.th

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Abstract
This paper explores a new practice model of integration between industry, academia, and research in China's vocational education, using the construction of "industry colleges" as an example. With rapid economic development and continuous technological advancement, traditional vocational education models are no longer sufficient to meet the market's demand for high-skilled talents. Through case study analysis, this paper examines the construction process of industry colleges, emphasizing the close collaboration among schools, enterprises, and research institutions. We explore how to achieve deep integration of education and industry through joint curriculum development, collaborative internship programs, and research cooperation. Additionally, this paper analyzes current challenges in implementation, such as uneven resource allocation, balancing interests, and insufficient policy support, and proposes corresponding solutions. By summarizing practical cases, we argue that establishing an effective industry-academia-research cooperation mechanism can significantly enhance the quality and efficiency of vocational education, thereby better serving the development of the economy and society. Ultimately, this paper calls for more policy support and social attention to promote the nationwide adoption and application of this new model.

Resumo
Este artigo explora um novo modelo prático de integração entre a indústria, o meio acadêmico e a pesquisa no ensino profissionalizante da China, utilizando a criação de "faculdades industriais" como exemplo. Com o rápido desenvolvimento econômico e o avanço tecnológico contínuo, os modelos tradicionais de ensino profissionalizante já não são suficientes para atender à demanda do mercado por talentos altamente qualificados. Por meio da análise de estudos de caso, este artigo examina o processo de criação das faculdades industriais, enfatizando a estreita colaboração entre escolas, empresas e instituições de pesquisa. Exploramos como alcançar uma integração profunda entre educação e indústria por meio do desenvolvimento conjunto de currículos, programas de estágio colaborativos e cooperação em pesquisa. Além disso, este artigo analisa os desafios atuais na implementação, tais como a alocação desigual de recursos, o equilíbrio de interesses e o apoio político insuficiente, e propõe soluções correspondentes. Ao resumir casos práticos, argumentamos que o estabelecimento de um mecanismo eficaz de cooperação entre indústria, academia e pesquisa pode melhorar significativamente a qualidade e a eficiência do ensino profissionalizante, servindo assim melhor ao desenvolvimento da economia e da sociedade. Por fim, este artigo apela por mais apoio político e atenção social para promover a

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adoção e aplicação desse novo modelo em todo o país.

Palavras-chave: *Faculdades Industriais. Educação Profissional. Integração entre Indústria e Educação. Mecanismo de Cooperação. Qualidade da Educação.*

1 INTRODUCTION TO INDUSTRY-ACADEMIA INTEGRATION IN VOCATIONAL EDUCATIO

The integration of industry and academia has emerged as a pivotal strategy in vocational education, particularly in the context of China's rapid economic development and the evolving demands of its labor market. The historical separation between educational institutions and industries has led to a skills gap, where graduates often find themselves inadequately prepared for the workforce. This disconnect has prompted a reevaluation of educational approaches, leading to a growing recognition of the importance of collaboration between these two sectors.

In recent years, the Chinese government has prioritized the enhancement of vocational education as a means to drive economic growth and innovation. Policies have been implemented to encourage partnerships between educational institutions and industries, fostering an environment where students can acquire practical skills that align with current market needs. This initiative not only aims to improve the employability of graduates but also seeks to create a workforce that is adaptable to technological advancements and industry changes.

The significance of industry-academia integration extends beyond individual employability. It plays a crucial role in fostering innovation and enhancing the competitiveness of industries. By collaborating with educational institutions, companies can engage in research and development, access a pool of fresh ideas, and cultivate potential future employees who are already familiar with their operational environments. Such partnerships can lead to the co-creation of curricula that reflect the competencies required in the workplace, ensuring that educational outcomes are relevant and impactful.

Furthermore, successful integration can serve as a catalyst for regional economic development. Areas with strong industry-academia partnerships often experience an

influx of investment, as businesses are more likely to establish operations in locales where they can easily collaborate with educational institutions. This not only boosts local economies but also contributes to the overall enhancement of the national workforce.

Case studies from various regions demonstrate the effectiveness of this integration model. For instance, collaborations between technical universities and manufacturing companies have resulted in specialized training programs that equip students with hands-on experience in advanced technologies. These initiatives have shown promising outcomes, with participating students reporting higher job placement rates and satisfaction levels post-graduation.

In summary, the background of industry-academia integration in vocational education is rooted in the necessity to bridge the gap between education and industry demands. Its significance lies in fostering a skilled workforce, stimulating innovation, and driving economic development, ultimately positioning China to compete effectively in the global market.

The primary objective of this study is to explore and establish a comprehensive understanding of the integration between industry and academia within the context of vocational education in China. This integration aims to bridge the gap between theoretical knowledge and practical application, thereby enhancing the employability of graduates and meeting the evolving demands of the labor market.

Specific objectives include identifying the key elements that contribute to successful industry-academia partnerships, analyzing current practices in vocational education institutions, and assessing the impact of these integrations on both students and industries. By systematically examining existing models, the study seeks to highlight best practices and areas for improvement, ultimately contributing to the development of a more effective vocational education framework that aligns with industry needs, earch and implementation efforts in the field.

2 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The evolution of vocational education in China can be traced back to ancient times, where practical skills were imparted through apprenticeships within various trades, such as agriculture, craftsmanship, and commerce. The establishment of guilds facilitated

the transmission of knowledge and skills, laying the groundwork for a more structured form of vocational education.

In the early 20th century, the modern vocational education system began to take shape. The Qing Dynasty's late reforms introduced formal vocational schools, aiming to modernize the workforce in response to foreign competition and internal challenges. This period marked a significant shift, as educational policies began to recognize the importance of cultivating technical skills alongside traditional academic knowledge.

The founding of the People's Republic of China in 1949 brought about radical changes in the educational landscape, including vocational training. The government prioritized vocational education as a means to support industrialization and economic development. During the 1950s and 1960s, a network of vocational schools was established, focusing on various sectors, including agriculture, industry, and services. Educational reforms emphasized a hands-on approach, aligning training with the needs of the economy.

The Cultural Revolution (1966-1976) disrupted the vocational education system, as academic and technical training was devalued in favor of ideological education. Many vocational institutions were closed or repurposed, leading to a significant decline in skill development. Following this tumultuous period, the late 1970s ushered in a new era of reform and opening-up policies, which resulted in a renewed focus on vocational education. The government recognized the urgent need for skilled labor to fuel economic growth and began to revitalize vocational institutions.

In the 1980s, the introduction of the “three types of education” policy—academic, vocational, and adult education—aimed to create a comprehensive educational framework. Vocational education was restructured to better meet the demands of a rapidly changing labor market, with an emphasis on practical skills and collaboration with industries. The establishment of partnerships between educational institutions and enterprises became a cornerstone of this new approach, promoting internships and on-the-job training.

The 1990s and 2000s witnessed further advancements in vocational education, driven by globalization and technological advancements. The Chinese government implemented policies to enhance the quality and relevance of vocational programs, encouraging schools to adopt a competency-based curriculum. International cooperation

and exchange programs also gained traction, allowing Chinese vocational institutions to learn from global best practices.

Recent years have seen a significant shift towards integrating industry and academia through various initiatives. The “Made in China 2025” strategy emphasizes the need for a skilled workforce capable of driving innovation and technological advancement. Consequently, vocational education is increasingly viewed as a critical component of China's economic strategy, focusing on producing high-quality talent that meets the demands of modern industries.

Overall, the historical development of vocational education in China reflects a dynamic interplay between socio-economic needs and educational policy reforms. The journey from traditional apprenticeships to a more integrated and systematic approach exemplifies the ongoing adaptation of vocational education to meet the challenges of an evolving labor market.

The theoretical foundations of industry-academia integration in vocational education are rooted in several interdisciplinary frameworks that facilitate collaboration between educational institutions and industries. This integration seeks to bridge the gap between theoretical knowledge and practical application, ensuring that educational outcomes align with industry needs.

One significant theory underpinning this integration is the Human Capital Theory, which posits that investment in education and training enhances an individual's productivity and economic value. This theory emphasizes the importance of aligning skill development with labor market demands, suggesting that vocational education should be designed with industry input to equip students with relevant competencies.

Another relevant framework is the Social Exchange Theory, which examines the reciprocal relationships between educational institutions and industries. This theory highlights the mutual benefits derived from collaboration, where industries gain access to a skilled workforce, and educational institutions receive resources, expertise, and real-world insights. Such partnerships can lead to co-developed curricula, internships, and research opportunities, fostering a symbiotic relationship that enhances the educational experience.

Additionally, the Constructivist Learning Theory plays a crucial role in shaping the integration process. This theory advocates for experiential learning, where students

actively participate in the learning process through hands-on experiences and real-world problem-solving. By involving industry partners in the educational process, students can engage in projects that reflect actual workplace challenges, thereby gaining practical skills and knowledge that are directly applicable to their future careers.

3 PROPOSED MODEL FOR INDUSTRY-ACADEMIA INTEGRATION IN VOCATIONAL EDUCATION

Curriculum development focuses on aligning educational programs with industry needs. The involvement of industry professionals in curriculum design ensures that the content is relevant and up-to-date. For instance, partnerships with local industries could lead to the creation of specialized courses that address emerging technologies and skills shortages. An example of this can be seen in a collaboration between a technical college and a manufacturing company, where the college integrated advanced manufacturing techniques into its curriculum, resulting in graduates who are immediately employable.

Collaborative projects serve as a practical application of theoretical knowledge. These projects foster hands-on experience for students and provide valuable insights for industries. For example, a joint research initiative between a university and a healthcare provider could lead to the development of new medical technologies. Students participating in such projects not only gain practical skills but also establish professional networks that enhance their employability.

The implementation phase emphasizes establishing a framework for continuous feedback between academia and industry. Regular evaluation sessions can be organized to assess the effectiveness of the curriculum and collaborative projects. Industry representatives can provide insights on student performance and emerging trends, while academic institutions can share data on graduates' success rates. This iterative process allows for timely adjustments to be made, ensuring that the educational offerings remain aligned with industry demands.

To support the model's implementation, dedicated resources such as training workshops for faculty and industry liaison officers can be established. These resources will equip educators with the necessary skills to engage with industry partners effectively.

Furthermore, leveraging technology, such as online platforms for project collaboration and communication, can enhance the interaction between stakeholders.

The effectiveness of partnerships between educational institutions and industry partners also requires evaluation. Metrics such as the number of collaborative projects undertaken, joint research initiatives, and the frequency of industry-led workshops or seminars can provide insights into the depth of collaboration. Additionally, assessing the outcomes of these partnerships, such as the development of new curricula or the establishment of mentorship programs, can further illustrate their effectiveness.

Financial sustainability is another crucial performance metric. This involves analyzing the funding sources for the integration model, including government support, industry contributions, and tuition income. Evaluating the cost-effectiveness of the programs implemented, alongside the return on investment for both educational institutions and industry partners, will provide a comprehensive view of the financial viability of the integration model.

Finally, long-term impact metrics should be established to assess the broader implications of industry-academia integration. These may include tracking the career progression of alumni, industry innovation attributed to collaborative projects, and the overall contribution to regional economic development. A longitudinal study design could be employed to monitor these impacts over several years, providing valuable data for continuous improvement.

Through the application of these evaluation criteria and performance metrics, stakeholders can gain a comprehensive understanding of the effectiveness of the proposed industry-academia integration model in enhancing vocational education in China.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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