

Factors Influencing Corporate Participation in Graduate Education under the Industry-University-Research Integration Model

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Abstract: *Based on the context of industry-university-research integration, this paper systematically analyzes the current status, multi-dimensional value, and practical challenges of corporate participation in graduate education. Furthermore, it examines the key factors influencing corporate involvement in graduate education. Research indicates that various models of corporate participation in graduate education have been developed in China, which provide multi-dimensional value in enhancing teaching quality, driving corporate innovation, and fostering student development. However, practical challenges hinder the depth and effectiveness of industry-university-research integration. This paper provides theoretical insights and practical pathways for deepening industry-university-research integration and constructing a high-quality graduate education system by analyzing the key factors influencing corporate involvement in graduate education.*

Keywords: Industry-University-Research Integration; Corporate Participation; Graduate Education; Influencing Factors; University-Enterprise Cooperation.

1. INTRODUCTION

Graduate education plays a critical role in the cultivation of high-level talent and fostering innovation. It is of significant importance for supporting major national strategies and building a strong education system (Wang et al, 2022, Xiong et al, 2026). As a core strategy for cultivating innovative talent, the essence of graduate education lies in the deep integration of research and teaching to foster original innovative abilities in graduate students (Wang and Long, 2025), rather than merely focusing on the application of knowledge in a single dimension. The deep integration of Industry-University-Research is a key pathway to accelerating the cultivation of innovative talent. It is an important measure to address the mismatch between the supply of innovative talent and societal demand, as well as to achieve a deep coupling of education and innovation. How to promote the deep integration of Industry-University-Research is a key strategic task at present. The Third Plenary Session of the 20th Central Committee of the Communist Party of China proposed strengthening industry-led Industry-University-Research Integration and deepening reforms in the talent development system and mechanism (Xinhua News Agency, 2025). The Second National Education Conference proposed strengthening university-enterprise research cooperation to accelerate the transformation of more scientific and technological achievements into productive forces (Yang and Peng, 2025). This has pointed the way for cultivating innovative talent through Industry-University-Research Integration and provided fundamental guidance for promoting Industry-University-Research Integration (Wang, 2021).

Although the direction is clear and the models of corporate participation in graduate education have been initially established, significant challenges remain in practice. Currently, although various models of corporate participation in graduate education, such as university-enterprise cooperation, joint training, dual mentorship systems, and targeted training, have been established, their practical effectiveness remains underdeveloped. Common issues include superficial collaboration, short-term corporate motives, loose coordination mechanisms, and delayed evaluation and incentives. As a result, most university-enterprise partnerships still remain at the superficial level of providing internship positions, without deeply engaging in the core aspects of talent cultivation. These challenges reflect a fundamental research question: What are the key factors that influence, or even determine, the breadth, depth, and sustainability of corporate involvement in graduate education? Analyzing the key factors influencing corporate participation in graduate education holds significant theoretical value and practical importance. It serves as both the theoretical foundation and the action prerequisite for advancing Industry-University-Research Integration from a formal association to a deeper, more substantive development, as well as for building high-quality education.

2. CURRENT STATUS AND ISSUES OF CORPORATE PARTICIPATION IN GRADUATE EDUCATION

2.1 Modes of Corporate Participation in Graduate Education

Corporate participation in graduate education is a key mechanism to address the mismatch between the supply of innovative talent and industry needs. By integrating real-world technical challenges from enterprises into the graduate training process, it precisely aligns with corporate demands, thereby shifting graduate education from traditional knowledge delivery to the cultivation of problem-solving abilities in graduate students. Currently, a graduate education training system centered around Industry-University-Research Integration has been preliminarily established in the field of graduate education in China (Liu et al, 2023). A diversified range of graduate training models has been formed. Common modes of corporate participation in graduate education include university-enterprise cooperation, joint training, dual mentorship systems, and university-enterprise targeted training, among others (Wang et al, 2024, Shen, 2025).

The traditional university-enterprise cooperation model centers around theoretical teaching for graduate students by universities, with enterprises participating by offering internship and practical opportunities. The content of these internships or practical experiences mostly involves repetitive tasks such as production line operations and basic data processing. In general, enterprises do not take on the role of teaching guidance. The joint training model involves universities, enterprises, and research institutions collectively participating in graduate education. Each party provides specific contributions: universities offer research topics and theoretical guidance, enterprises provide technical support and practical platforms, and research institutions supply research and development resources and innovative methodologies. Together, they develop graduate education training plans and deeply engage in the training process, ensuring the organic unity of project design, technological development, and practical application. In the dual mentorship model, the two mentors are the university supervisor and the enterprise mentor. In this model, graduate students are required not only to take courses outlined in the university's training plan but also to learn enterprise-related courses such as joint university-enterprise development courses and business courses under the guidance of the enterprise mentor, in line with research and development needs. Under the guidance of both mentors, graduate students can acquire more specialized knowledge in relevant academic fields and better develop their innovative research capabilities (Liang et al, 2023). The university-enterprise targeted training model involves enterprises collaborating with universities to develop graduate education plans based on their needs. It supports graduates in directly entering enterprises after graduation, providing job security and career development pathways for those trained under this model, thus achieving a precise match and connection between talent cultivation and enterprise employment needs. The diversified models of corporate participation in graduate education collectively form the practical framework for current Industry-University-Research Integration, providing a systematic practical pathway for its deep integration.

2.2 The Multi-dimensional Value of Corporate Participation in Graduate Education

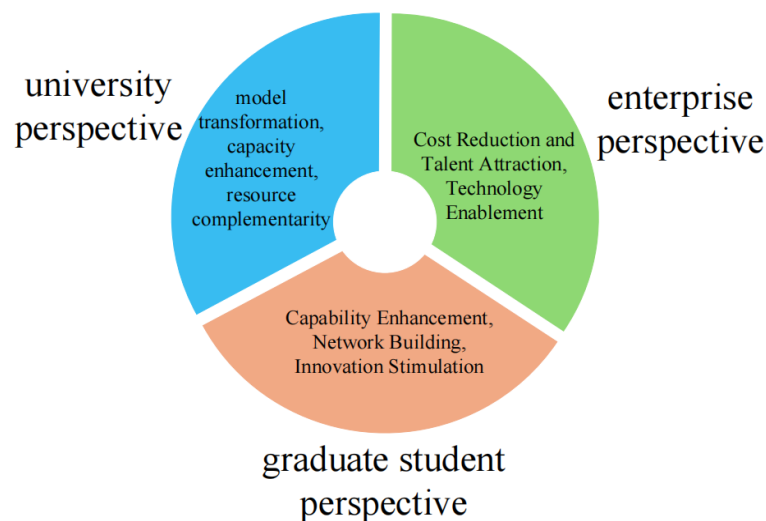


Figure 1: Multidimensional Value Map of Corporate Participation in Graduate Education

The benefits brought by corporate participation in graduate education models go far beyond the simple supply of talent. This model of graduate education is not only a key mechanism for addressing the disconnection between industry, academia, and research, but also an effective strategic measure for enhancing the quality of university education, driving the development of enterprises, and stimulating innovation. The multi-dimensional value of corporate participation in graduate education is shown in Figure 1.

2.2.1 Educational Value for Universities and Graduate Training

Corporate participation in graduate education fundamentally enriches the content of graduate education, driving the transformation of the graduate education model from a “discipline-oriented” approach to a “problem-oriented” and “competency-oriented” approach. In the dual mentorship model, the involvement of the enterprise mentor and the establishment of joint university-enterprise development courses ensure that the content of graduate education accurately reflects the latest industry technology standards and market trends. The knowledge learned by graduate students is no longer limited to theoretical knowledge from textbooks, but instead consists of a knowledge system that is in sync with, or even ahead of, industry development, effectively promoting a precise alignment between graduate education content and market trends. In addition, the real-world scenarios and engineering environments provided by enterprises are beyond what university laboratories can simulate. In this training environment, graduate students are required to consider practical factors such as technical feasibility, cost constraints, process flows, and safety measures, rather than being limited to experiments conducted under simulated or ideal conditions. This hands-on experience in real-world settings not only enhances the engineering practice abilities of graduate students but also develops their systems thinking and ability to solve complex engineering and scientific problems. Moreover, the model of corporate participation in graduate education can also optimize the structure of the mentor team and the guidance model. The dual mentorship model breaks through the limitations of single mentorship by university supervisors. Through collaborative guidance between university and enterprise mentors, it creates a complementary advantage between the theoretical depth and practical breadth of the content learned by graduate students. University mentors ensure the rigor and theoretical depth of academic research, while enterprise mentors ensure the practical value and feasibility of the research direction. This model not only enhances the quality of guidance but also promotes communication between universities and enterprises.

2.2.2 Strategic Value for Enterprises

By participating in the graduate education process, enterprises are no longer passive recipients of graduates produced by universities. Instead, they intervene in the graduate training process. Enterprises can collaborate with universities to design courses and define research topics based on their own needs and business plans, allowing graduate students to be exposed to and master the specific knowledge systems and technical tools required by the enterprise during their studies. Moreover, by directly providing positions for graduates, enterprises significantly reduce the costs of external recruitment and the costs of basic training after employment. Moreover, universities and research institutions serve as fertile ground for cutting-edge technological exploration. By participating in the graduate education process, enterprises can transform the real and specific technical challenges encountered in their production processes into graduate thesis topics or research projects at research institutions. Under the collaborative guidance of university and enterprise mentors, these challenges can be addressed effectively. This process allows enterprises to access external sources of innovation and avoid the limitations of a single internal perspective. Moreover, the process of enterprise mentors guiding graduate students is itself a mutually beneficial teaching experience. Through deep collaboration with universities, enterprises gain access to broader academic networks, thereby enhancing their own research and development capabilities and influence.

2.2.3 Developmental Value for Graduate Students

Under the influence of deep Industry-University-Research Integration, graduate students are the most direct beneficiaries. Their capabilities, professional competitiveness, and future career prospects are substantially enhanced. In particular, under the university-enterprise targeted training model, graduate students develop a clearer understanding of their career plans from the time they enroll. They can also adapt to and acquire professional skills and experience specific to certain industries or positions in advance, giving them a significant competitive advantage in the job market. During graduate internships, students have the opportunity to engage with specific industries in advance and establish connections with technical experts, thereby forming an initial professional network. This early exposure provides graduate students with a distinct advantage in accessing career-related information and making informed decisions regarding opportunities. Moreover, corporate involvement in graduate education can stimulate students' innovative potential (Liu, 2012). Throughout the

training process, graduate students have the opportunity to validate and transform their innovative ideas on enterprise-provided platforms, potentially culminating in core technological patents. This experience not only strengthens their innovative thinking and capabilities but may also serve as a new launching point for their professional careers.

2.3 Practical Challenges of Corporate Involvement in Graduate Education

Although corporate involvement in graduate education demonstrates multidimensional value and has led to diversified collaboration models in practice, its deeper implementation still faces a series of challenges, hindering the transformation of industry–university–research integration from a formal alignment to a substantive integration.

2.3.1 Superficiality and short-termism in the level of cooperation

Currently, most enterprises' involvement in graduate education follows a traditional model of university-enterprise collaboration, which fails to effectively implement the core aspects of talent development. In this model, the role of enterprises is limited to providing internship opportunities, and the work that graduate students engage in often consists of repetitive, auxiliary tasks unrelated to research and development. This form of participation fails to integrate the enterprises' real technological expertise with the university's talent cultivation process, thus undermining the original intent of their involvement. Moreover, enterprises' motivation for participating in graduate education tends to be short-term and utilitarian. Many enterprises view it as a low-cost labor solution rather than a long-term strategic investment in talent. This tendency leads to a lack of continuity in their investment and insufficient stability in collaboration.

2.3.2 The Inadequacy of the Collaborative Training Mechanism

In the collaborative training process of graduate education involving enterprises, the dual-mentor guidance model often faces challenges such as the dominance of university mentors and the subordinate role of enterprise mentors, or the transformation of the dual-mentor model into a single-mentor model. The responsibilities and authority of enterprise mentors lack institutional safeguards, resulting in significant disparities in their level of involvement and the quality of guidance provided. Moreover, some enterprise mentors, due to their lack of research expertise or limited teaching capacity, struggle to offer systematic guidance to graduate students, causing the dual-mentor model to become superficial. Moreover, university mentors tend to focus on theory and innovation, while enterprise mentors prioritize production costs and feasibility in research and development. Due to the lack of an effective and unified communication and coordination platform, ideological differences between the two parties are likely to arise during the graduate education process, which can negatively impact the effectiveness of training.

2.3.3 The Lag in the Evaluation and Incentive System

The existing evaluation system cannot fully accommodate the deep integration of industry, academia, and research. From the perspective of university evaluation, the main criteria for assessing university faculty and promoting academic titles are academic papers, research projects, and other similar indicators. However, in the university-enterprise cooperation model where enterprises participate in graduate education, the contributions of university faculty in areas such as curriculum development and guiding graduate student practices are difficult to quantify, which in turn reduces faculty motivation. From the enterprise evaluation perspective, the investment in graduate education cannot be directly translated into short-term benefits for the enterprise, and therefore holds a low proportion in the enterprise's performance assessment system. As a result, enterprises are less motivated to select outstanding technical experts as mentors or open up their research and development resources.

3. ANALYSIS OF KEY FACTORS INFLUENCING ENTERPRISES' PARTICIPATION IN GRADUATE EDUCATION

In the context of Industry-University-Research Integration, the depth and breadth of enterprise involvement in graduate education are influenced by a range of internal and external factors. Advancing the development of Industry-University-Research Integration requires not only innovation in models and expansion of practices but also a deeper understanding and grasp of the factors that influence it. Enterprise involvement in graduate education—its scope, methods, and outcomes—are influenced by a variety of factors. Understanding these factors is crucial, as identifying the key ones is a prerequisite for advancing the deep integration of

Industry-University-Research Integration.

3.1 Internal Factors of Enterprises

3.1.1 Enterprise Strategic Awareness and Positioning

The strategic awareness and positioning of enterprises are core factors that influence their involvement in graduate education. Whether an enterprise views participation in graduate education as a long-term strategic investment in talent with future returns or merely as a cost-saving measure to meet short-term needs directly determines the resources allocated and the sustainability of their involvement. Enterprises with a long-term vision and an innovative spirit are more likely to choose participation models such as joint training and targeted training, actively integrating talent development into their research and development system. In contrast, enterprises with a short-term, utilitarian perspective tend to adopt superficial cooperation models, resulting in insufficient sustainability and stability in the collaboration.

3.1.2 Enterprise's Resources and Capabilities

The resources and capabilities of an enterprise are objective constraints on its participation in graduate education, including human resources, financial resources, technological resources, and organizational management capabilities. The human resources of an enterprise directly determine whether it has a sufficient number of qualified professional and technical personnel with the necessary guidance capabilities to serve as enterprise mentors. The lack of qualified enterprise mentors is a key reason for the dilemma of “university mentor dominance, with enterprise mentors as adjuncts” or the transformation of “the dual-mentor system into a single-mentor system”. The financial resources of an enterprise determine whether it can bear the direct costs of project development, experimental materials, and safety measures during graduate internships, as well as the time cost of enterprise mentors and the indirect costs of collaborative management. The technological resources of an enterprise determine whether it is willing to offer graduate students access to authentic projects and data with sufficient technical content for learning and practice, rather than merely providing marginal, repetitive tasks. This, in turn, determines the quality of the enterprise's involvement in graduate education. Additionally, an enterprise with professional organizational management capabilities can ensure the standardization of its management of graduate students.

3.2 External Environmental Factors

3.2.1 Policy and Institutional Factors

In the process of advancing the deep integration of Industry-University-Research Integration, the government plays a key role as both a guide and an enabler (Bai, 2020). The policies and institutional frameworks that provide clear tax deductions or financial subsidies for enterprises' involvement in graduate education can effectively reduce the cost sensitivity of enterprise participation. Additionally, whether the government incorporates deep enterprise involvement in graduate education as an important indicator for awarding honors to enterprises will significantly influence their enthusiasm for participation. Furthermore, clear legal regulations or contractual templates that guide the protection of graduate students' rights during internships and clarify accident liability can also reduce enterprises' concerns and the risk of disputes.

3.2.2 The Impact of University Collaboration Models

As a partner in collaboration, the model of cooperation employed by universities is crucial to enterprises' enthusiasm for participating in graduate education. Whether universities can break away from the traditional credit and thesis evaluation systems to tailor or adjust training programs for different enterprises, as well as whether universities can demonstrate their research and development capabilities in addressing technical issues of concern to enterprises, determines whether the collaboration is based on equality and whether the needs of both parties are aligned. Additionally, whether universities can reform faculty evaluation systems to recognize faculty contributions to practical teaching in industry-university collaboration directly impacts the enthusiasm of university mentors in participating in Industry-University-Research Integration projects, thereby influencing the efficiency of collaboration. Moreover, whether universities proactively establish and maintain communication platforms with enterprises also plays a significant role in determining the collaboration efficiency (Mao and Liu, 2022).

4. CONCLUSION AND OUTLOOK

4.1 Conclusion

This paper systematically analyzes the current state of enterprise involvement in graduate education under the context of Industry-University-Research Integration. The conclusion indicates that China has established diversified models of enterprise participation, which demonstrate multidimensional value. However, the practical outcomes have not been fully realized due to challenges such as superficial collaboration, loose mechanisms, and delayed incentives. The underlying reason lies in the fact that enterprise participation is influenced by both internal factors within the enterprise and external environmental factors. The internal strategic awareness and positioning, resources, and capabilities of an enterprise are fundamental factors that determine the depth and sustainability of its participation. On the other hand, external policies and institutional frameworks constitute key supporting or constraining factors.

4.2 Outlook

Shifting enterprise involvement in graduate education from formal integration to substantial collaboration is a key aspect of deepening the Industry-University-Research Integration. In the future, progress should be made at three levels: Cognitive and Strategic Level: Enterprises should be guided to move beyond viewing graduate education as a short-term cost-saving measure for human resources, and instead incorporate it into their innovation systems and talent development strategies. Mechanism and Operational Level: It is necessary to improve the mechanisms for university-enterprise cooperation, clearly define the responsibilities of both universities and enterprises, and ensure that the collaboration is embedded in the entire process of talent development. Policy and Support Level: A precise policy support system should be established, providing substantial incentives for enterprises that deeply participate, and incorporating the outcomes of Industry-University-Research Integration into the evaluation metrics for universities and enterprise innovation capabilities, thereby enhancing the willingness of both parties to collaborate. By systematically advancing at the strategic, collaborative mechanism, and policy support levels, we can drive the shift from formal integration to substantial collaboration in graduate education, leading to a profound transformation in the collaborative cultivation of talent between universities and enterprises.

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