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THE INDUSTRY–EDUCATION INTEGRATION TRAINING MECHANISM AND PRACTICE FOR PROFESSIONAL DEGREE POSTGRADUATES IN ENGINEERING MANAGEMENT ORIENTED TOWARD NEW QUALITY PRODUCTIVE FORCES

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Abstract: New quality productive forces have created an urgent need for the systematic restructuring of the knowledge architecture, practical competencies, and training models of engineering management professionals. Currently, the cultivation of professional degree postgraduates in engineering management is beset by core problems, including a mismatch between curriculum design and industry demands, a disconnect between practice-based teaching and authentic engineering settings, insufficient depth in university–enterprise cooperation, and an evaluation mechanism misaligned with competency orientation. To address these issues, this paper proposes strategies for constructing an industry–education integration training model for professional degree postgraduates in engineering management that is oriented toward new quality productive forces. These strategies encompass a trinity industry–education integrated curriculum system of "theoretical courses + practical courses + innovative courses," a "Four-Shared, Four-Through" university–enterprise collaborative operation mechanism, a multi-dimensional competency evaluation mechanism oriented toward practical outcomes, and the strengthening of a university–enterprise collaborative education community. Through pilot implementation and iterative refinement, a new industry–education integration ecosystem has taken shape in which "education is embedded in industry and industry is integrated with education." This training model has significantly enhanced postgraduates' core competencies, employment quality, and industrial adaptability, offering a transferable educational reform blueprint for local universities.
Keywords: New quality productive forces; Engineering management; Professional degree postgraduates; Industry–education integration

1 INRTODUCTION

Accelerating the development of new quality productive forces has become the primary task in promoting high-quality development, ushering China's economy into a new stage in which innovation serves as the foremost driver and talent as the premier resource [1]. In the fields of engineering education and talent cultivation, the state has successively issued documents including the "Professional Degree Postgraduate Education Development Plan (2020–2025)", the "Opinions on Further Promoting the Classified Development of Academic and Professional Degree Postgraduate Education", the "Guiding Opinions on Promoting the Synergistic Development of Intelligent Construction and Building Industrialization", the "Several Opinions on Accelerating the Development of New-Type Building Industrialization", and the "Outline for Building a Strong Education Nation (2024–2035)". These policies have imposed urgent demands for the digital and intelligent transformation of engineering management talent cultivation. Research on the industry–education integration training mechanism for professional degree postgraduates in engineering management oriented toward new quality productive forces constitutes both a proactive response to national strategic needs and a concrete implementation of policies for reforming professional degree postgraduate education, thereby bearing distinct contemporary significance and practical value.
As postgraduate cultivation shifts from extensive expansion to intensive quality improvement, scholars at home and abroad have conducted substantial explorations. Developed countries in Europe and America have established relatively mature industry–education integration training frameworks [2]. Prestigious institutions such as the Massachusetts Institute of Technology have set up joint training centers with large engineering conglomerates, forming sophisticated multi-stakeholder collaborative education mechanisms [3-4]. In China, scholarly attention to the industry–education integration cultivation of professional degree postgraduates in engineering management has continued to rise. Leading universities, including Tsinghua University, have co-established joint training bases with major engineering enterprises, giving rise to various training models such as "project-driven, team-based collaboration," "five-dimension integration," and "one horizontal axis, two vertical pillars, and three integrations." Meanwhile, some researchers have introduced analytical frameworks such as the triple helix theory, collaborative education theory, and stakeholder theory, and have incorporated BIM, big data, and artificial intelligence into practice-based teaching. Nevertheless, against the backdrop of new quality productive forces, research on the industry–education integration training mechanism and practice for

professional degree postgraduates in engineering management remains scant. In particular, systematic research addressing the new competency structure requirements for engineering management talents in this emerging era is still insufficient.

Taking the Master of Engineering Management program at Hebei GEO University as the research subject and capitalizing on the university's distinctive geological strengths, this paper conducts research on the industry–education integration training mechanism and practice for professional degree postgraduates in engineering management oriented toward new quality productive forces across four dimensions: constructing a trinity industry–education integrated curriculum system of "theoretical courses + practical courses + innovative courses" to enhance the practicality and pertinence of course instruction; designing a "Four-Shared, Four-Through" university–enterprise collaborative operation mechanism that focuses on synergy in the cultivation process and strives to dismantle institutional barriers; building a multi-dimensional competency evaluation mechanism oriented toward practical outcomes to fully leverage the "baton" function of assessment; and, through pilot implementation and iterative refinement, developing a replicable and scalable industry–education integration training model for professional degree postgraduates in engineering management.

2 CULTIVATION DEMANDS FOR PROFESSIONAL DEGREE POSTGRADUATES IN ENGINEERING MANAGEMENT IN THE CONTEXT OF NEW QUALITY PRODUCTIVE FORCES

2.1 Demands from Industrial Development

New quality productive forces, propelled primarily by scientific and technological innovation, are driving the engineering construction industry toward smart construction, green and low-carbon practices, and new-type infrastructure. Technologies such as digital twins, the Internet of Things, and artificial intelligence permeate the entire project lifecycle, while new business forms—including new energy engineering, smart cities, and geo-environmental engineering—are developing rapidly. As high-level applied, compound, and innovative talents, professional degree postgraduates in engineering management must have their cultivation objectives, curriculum systems, and practice models aligned with the frontiers of industry. The industry no longer finds traditional engineering management personnel adequate; instead, it urgently needs new-type engineering management talents equipped with digital technology application capabilities, green and low-carbon management skills, complex engineering decision-making ability, and cross-sector resource integration capacity.

2.2 Demands from Job Competency Requirements

New quality productive forces are upgrading engineering management positions toward digital intelligence, collaboration, and high-end sophistication, gradually forming a four-in-one competency system comprising "digital technology proficiency + complex engineering management capability + cross-boundary innovation capacity + comprehensive professional quality." The existing cultivation system displays notable deficiencies in the integration of digital technology, the fostering of innovation ability, and the alignment of professional quality. At the digital level, it demands capabilities in data-driven decision-making, intelligent tool application, and green and sustainable management and control; at the management level, it requires interdisciplinary collaboration, full-lifecycle coordination, and complex problem-solving skills; at the quality level, it calls for an international vision, compliance and risk control awareness, engineering ethics, and high-end operational competence. Reconstructing the cultivation system in response to these job competency requirements is the key to improving the quality of talent supply.

3 PROBLEMS EXISTING IN THE CURRENT CULTIVATION OF PROFESSIONAL DEGREE POSTGRADUATES IN ENGINEERING MANAGEMENT

3.1 Mismatch Between Curriculum System Design and Industry Demands

The current cultivation of professional degree postgraduates in engineering management exhibits a tendency to "emphasize theory over practice and academic learning over application." Although some universities have actively explored integrating practical courses into the talent cultivation curriculum system—for example, Tianjin University has implemented a course learning model under a university–enterprise supervisory team system, combining professional practice with degree theses to strengthen compound teaching through team-based theoretical study, case discussions, on-site experience, and project training, and Wuhan University of Technology has adopted an internal–external dual-supervisor system with diversified training formats such as course study and case analysis—most institutions still use the completion of a traditional academic dissertation as the graduation requirement. They lack courses on emerging technologies such as artificial intelligence, digital twins, BIM, and the industrial internet. The curriculum system has not effectively integrated enterprise needs into the professional course teaching framework, causing teaching objectives to deviate from enterprise demands. It falls particularly short of meeting the urgent requirements of intelligent construction and digital transformation driven by new quality productive forces, leaving a gap between the current training model and the compound, innovative, and application-oriented talent standards mandated by these forces.

3.2 Disconnect Between Practice-Based Teaching and Authentic Settings

The practice teaching formats for professional degree postgraduates in engineering management mostly rely on on-campus training, software simulation, or short-term enterprise observation visits. Postgraduates have very limited opportunities to enter real engineering sites and participate in the entire process of complex engineering decision-making and management. For instance, Chang'an University has organized MEM intelligent construction practice scenario teaching activities around the SY Industrial Park and SYYC project, and Beihang University has adopted a training model combining degree theory courses with comprehensive practice, offering two program directions in project management and data and information engineering management. Although these efforts have broken away from a single cultivation model that "stresses outcomes and neglects the process," the practice teaching formats largely remain short-term observation or brief experiential learning. The weight of enterprise participation is low, and there is a lack of long-term on-site teaching or job-embedded practice, neglecting the more cutting-edge, authentic engineering management scenarios [5]. In particular, against the backdrop of the nation's vigorous development of new quality productive forces, intelligent settings derived from it—such as smart construction sites, digital integrated delivery, and green construction—impose higher demands on graduates' practical ability to comprehensively apply technical and managerial knowledge in uncertain environments. Relying mainly on traditional lecture-based instruction prevents students from deeply experiencing industry-frontier technologies and real-world cases, making it difficult for them to adapt to the rapid and diversified development of the industry.

3.3 Insufficient Depth in University–Enterprise Cooperation

In the context of new quality productive forces, university–enterprise cooperation has transcended traditional talent cultivation and internship employment, upgrading into a strategic synergy characterized by the deep integration of the entire elements of the talent chain, education chain, industry chain, and innovation chain. Yet, current university–enterprise cooperation mostly remains at superficial levels, such as signing framework agreements, establishing internship bases, or sporadically hiring enterprise mentors; the cooperation model is relatively homogeneous, and the content remains rudimentary. To break through this predicament, China has attached great importance to deepening industry–education integration in recent years, successively issuing documents such as the "Several Opinions on Deepening Industry–Education Integration", the "Pilot Implementation Plan for National Industry–Education Integration Construction", and the "Action Plan for Adjusting and Optimizing the Disciplinary Structure of Higher Education (2025–2027)", which explicitly propose establishing an organic linkage mechanism connecting the "education chain, talent chain with the industry chain and innovation chain" [6–8]. In practice, these existing policies have mainly optimized the layout adjustment of disciplinary programs and exerted a government-led attention-guidance effect on universities, whereas the institutional incentives for enterprises to deeply engage in the entire process of talent cultivation remain inadequate. Phenomena such as "universities are enthusiastic while enterprises remain indifferent" and "cooperation is superficial and formalized" persist between universities and enterprises, compounded by a lack of effective outcome evaluation mechanisms, causing related efforts to become mere formalities. Consequently, a deep-level collaborative education mechanism has yet to be effectively established, preventing the formation of a virtuous cycle of effective linkage among talent cultivation, innovation upgrading, industrial advancement, and institutional safeguards.

3.4 Misalignment Between the Teaching Evaluation Mechanism and Competency Orientation

Under new quality productive forces, engineering management talents need to possess diversified capabilities, including interdisciplinary knowledge integration and intelligent tool application. However, the current evaluation system for professional degree postgraduates in engineering management remains largely isomorphic with that for academic degrees. The degree-conferral criteria are centered on the quantity of academic publications and the ranking of journals, lacking systematic measurement indicators for students' ability to solve practical engineering problems, professional quality, and innovative thinking. From the stakeholder perspective, employers, as key beneficiaries of talent cultivation, have long been absent from the evaluation process. The assessment subject has long been dominated by on-campus supervisors, while the evaluative weight of enterprise mentors and industry experts is disproportionately low, failing to form a diversified evaluation mechanism. This evaluation approach further exacerbates the situation of "valuing academics over practice," thereby creating a pronounced divergence between the "baton" function of evaluation and the competencies that professional degree graduates are expected to possess.

4 INNOVATIVE APPROACHES TO THE TRAINING MODEL FOR PROFESSIONAL DEGREE POSTGRADUATES IN ENGINEERING MANAGEMENT

Guided by the connotations and requirements of new quality productive forces and aligned with the actual needs of cultivating professional degree postgraduates in engineering management, this study has taken "deep industry–education integration, precise competency cultivation, and systematic mechanism construction" as its core principles. Using the professional degree postgraduates in engineering management at Hebei GEO University as the practical subjects, multi-dimensional and systematic research and practice have been carried out. The specific content is divided into four major modules (Figure 1).

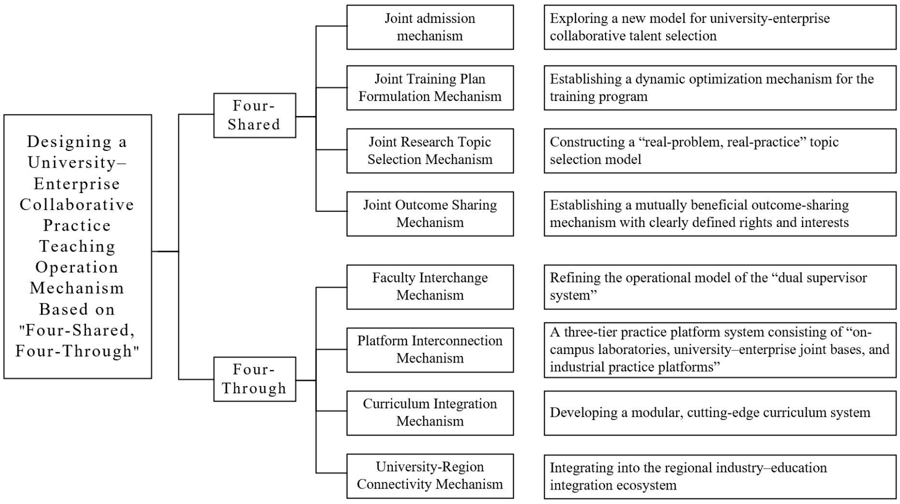

Figure 1 Designing a University–Enterprise Collaborative Practice Teaching Operation Mechanism Based on “Four-Shared, Four-Through”

4.1 Optimizing the Industry–Education Integrated Curriculum System for Professional Degree Postgraduates

In line with the digital, intelligent, and green development trends of the engineering construction industry, and based on the distinctive features and disciplinary positioning of Hebei GEO University, a core competency framework tailored to both the university’s reality and industry demands has been defined for professional degree postgraduates in engineering management. Building on this, a trinity industry–education integrated curriculum system of "theoretical courses + practical courses + innovative courses" has been further constructed, aiming to establish a sustainable "AI+" talent cultivation model driven by the dual integration of "industry–education and science–education."
(1) The theoretical course module was optimized first by adding core courses such as Digital Project Management, Intelligent Cost Analysis, Green Construction and Low-Carbon Engineering Management, and Deep Learning and Applications. Simultaneously, distinctive theoretical courses like Mineral Technical and Economic Evaluation and Mineral Resource Management Engineering were integrated into the existing curriculum, thereby enhancing the alignment between theoretical courses and the technological development of the construction industry.
(2) The practical course module was then constructed by co-developing case-based teaching courses with partner enterprises and adding courses related to enterprise project practice and comprehensive engineering management training. Emphasis was placed on strengthening case teaching based on actual enterprise engineering management practices, with particular attention paid to incorporating content from smart engineering and green engineering cases arising in the context of new quality productive forces.
(3) Finally, an innovative course module was added, featuring courses such as special lectures on cutting-edge topics in the engineering construction industry, innovative methods and practices for engineering projects, and interdisciplinary collaborative project practice, to cultivate postgraduates’ innovative thinking and interdisciplinary collaboration skills. Concurrently, reforms in course teaching models were implemented by adopting a hybrid teaching approach that combines "online + offline" and "on-campus + enterprise" methods, with on-campus supervisors and enterprise mentors delivering instruction together. Following this optimization, the practicality and pertinence of course teaching have been significantly enhanced.

4.2 Designing a University–Enterprise Collaborative Practice Teaching Operation Mechanism Based on "Four-Shared, Four-Through"

This study designed a systematic and operable university–enterprise collaborative education operation mechanism based on the "Four-Shared, Four-Through" framework (as shown in Figure 1).

4.2.1 "Four-shared"—focusing on synergy in the education process

(1)Initiating a new mechanism for joint recruitment to explore new models of university–enterprise collaborative talent selection. Enterprise evaluations are introduced during the admissions process, placing enterprise employment needs upstream in the selection phase. Specific methods for enterprise participation in interviews, vocational aptitude tests, and practical ability assessments are studied to form a comprehensive evaluation system integrating "academic potential + practical ability + professional quality."
(2)Implementing a new mechanism for jointly developing training plans to establish a dynamic optimization mechanism for the cultivation scheme. A training plan committee composed of on-campus experts, industry specialists, and enterprise executives is established to regularly analyze changes in industry demands and promptly adjust cultivation objectives, curriculum settings, and practice requirements.
(3)Establishing a new mechanism for jointly selecting research topics to build a topic selection model of "tackling real problems with real practice." In principle, the dissertation topics and course project topics of postgraduates should

originate from authentic technical or managerial problems that enterprises urgently need to solve. An enterprise project database is constructed, and a tripartite topic selection consultation system involving the student, supervisor, and enterprise is implemented to ensure the practical value and technical depth of the research topics.

(4)Exploring a new mechanism for shared outcomes to establish a mutually beneficial outcome-sharing mechanism with clearly defined rights and interests. The ownership of intellectual property generated during postgraduates' enterprise practice is clarified, and methods for distributing the benefits derived from the commercialization of results are formulated, thereby stimulating the endogenous motivation for university–enterprise collaborative innovation.

4.2.2 "Four-through"—focusing on dismantling institutional barriers

(1)Deepening the new mechanism for faculty interchange to refine the operational model of the "dual supervisor system." Standards and management measures for the selection and appointment of enterprise mentors are formulated, clearly defining their responsibilities, rights, and welfare provisions. A "two-way entry" faculty exchange mechanism is established, whereby young teachers are selected and dispatched for temporary enterprise postings on the one hand, and enterprise backbones are attracted to serve as adjunct professors or practice mentors on the other. An information platform for the collaborative guidance provided by university and enterprise supervisors is built to make the guidance process transparent and standardized.

(2)Exploring the new mechanism for platform interconnection to build a three-tier practice platform system consisting of "on-campus laboratories—university–enterprise joint bases—industrial practice platforms." Leveraging the superior resources of the university's School of Urban Geology and Engineering, an on-campus virtual simulation laboratory for engineering management is constructed. Joint post graduate training bases are co-established with leading industry enterprises. Connections with regional industrial parks are forged to expand industrial practice platforms. Drawing on the "university–enterprise community" management model of Zhejiang Wanli University, a joint university–enterprise working group is established to take charge of the planning, construction, and operational management of these platforms.

(3)Refining the new mechanism for curriculum integration to develop a modular, cutting-edge curriculum system. Industry-frontier technologies and real-world cases are transformed into teaching resources, with a focus on developing three types of courses: "AI + Engineering Management" crossover courses that introduce application cases of AI technology in engineering; university–enterprise co-taught courses where on-campus instructors and enterprise experts deliver instruction together; and project-based learning courses that use real projects as the vehicle to cultivate students' ability to solve complex engineering problems.

(4)Establishing the new mechanism for smooth university–region connectivity to integrate into the regional industry–education ecosystem. Proactive connections have been made with the development strategies of Hebei Province and the Beijing-Tianjin-Hebei region, and regular cooperation mechanisms have been established with local governments, industrial parks, and industry associations. Active participation in the construction of regional industry–education integration communities pools multiple resources to serve talent cultivation.

4.3 Constructing a Multi-Dimensional Competency Evaluation Mechanism Based on AI and Practical Outcome Orientation

In the wave of digitalization, new technological tools such as artificial intelligence, big data, and blockchain are emerging continuously, constantly pushing university teaching evaluation toward a direction that is more process-oriented, transparent, and systematic. This study has constructed a multi-dimensional competency evaluation mechanism oriented toward AI and practical outcomes, deeply integrating artificial intelligence with teaching evaluation and treating practical outcomes as an organic component of the entire evaluation system, thereby realizing a virtuous cycle of integrated "teaching, learning, and assessment" that covers the entire process and all elements.

(1)Enriching process-based assessment. Postgraduates' course learning and project research activities are incorporated into the assessment scope and quantitatively evaluated through classroom performance, practice reports, project execution, and mid-term checks, with an emphasis on evaluating their learning process and practical abilities.

(2)Strengthening outcome-based assessment. The dissertation evaluation method has been reformed to require postgraduates' dissertations to take real-world enterprise engineering management problems as their research objects, highlighting the practical, applied, and innovative nature of the thesis. Enterprise experts are simultaneously introduced to participate in the review and defense of the dissertations, thereby enhancing the industrial relevance of the thesis assessment.

(3)Establishing multiple assessment subjects. An evaluation panel jointly composed of on-campus supervisors, enterprise mentors, and employers conducts comprehensive assessments of postgraduates across multiple dimensions, including theoretical literacy, practical ability, innovative thinking, and professional quality.

Following the optimization of the evaluation mechanism, the assessment of professional degree postgraduates in engineering management at Hebei GEO University has broken away from the traditional examination model dominated by theoretical tests. A practice-outcome-oriented multi-dimensional competency evaluation mechanism has been established, combining "process-based assessment with outcome-based assessment," "on-campus assessment with enterprise assessment," and "competency assessment with professional quality assessment," thereby fully leveraging the "baton" function of evaluation.

4.4 Strengthening the Construction of a University–Enterprise Collaborative Education Community

As a university jointly supported by the province and the ministry and a key provincial backbone university, Hebei GEO University has upheld the construction philosophy of "service, integration, and leadership" in cultivating postgraduates in engineering management. Focusing on promoting university–enterprise dual-subject collaborative education, the university has established long-term cooperation platforms with research institutions such as the Hebei Building Science and Technology R&D Center and has built demonstrative virtual simulation training bases.
Under the "1+1.5" academic year system, professional degree postgraduates in engineering management complete their theoretical coursework at Hebei GEO University in their first year. In addition to traditional specialized courses, innovative courses linked to the industry frontier—such as Smart Construction Sites and IoT Applications, Green Construction and Sustainable Development, and Innovative Design in Engineering Management—have been introduced. In their second and third years, postgraduates enter enterprises or research institutions for internships and practice, with enterprise chief engineers serving as industry mentors, while on-campus supervisors provide timely guidance to steer postgraduates' research in the right direction. Under this training model, postgraduates can effectively apply theoretical knowledge to practice, and their professional competencies and employment competitiveness have been significantly enhanced. By establishing a long-term mechanism for industry–university–research cooperation, the construction of a university–enterprise collaborative education community has been strengthened, forming a new industry–education integration ecosystem in which "education is embedded in industry and industry is integrated with education."

5 CONCLUSIONS AND PROSPECTS

5.1 Conclusions

Oriented toward the developmental demands of new quality productive forces, this study has focused on the systematic construction of an industry–education integration training mechanism for professional degree postgraduates in engineering management. Through theoretical analysis and practical validation, a trinity training mechanism framework comprising "curriculum system optimization—university–enterprise collaborative mechanism design—multi-dimensional competency evaluation system" has been formed. The research demonstrates that, for cultivating engineering management talents tailored to new quality productive forces, a three-dimensional core competency system of "geoscience + engineering + digital intelligence" should be constructed. The implementation of the "Four-Shared, Four-Through" university–enterprise collaborative operation mechanism can effectively resolve the superficial and fragmented dilemmas of industry–education integration. The establishment of a multi-dimensional competency evaluation mechanism based on AI technology and practical outcome orientation facilitates the shift in evaluation criteria from "valuing academic achievement" to "valuing practical competence." This study has been practically validated through the professional degree program in engineering management at Hebei GEO University, and the results indicate that the mechanism has significantly enhanced postgraduates' core competencies, employment quality, and industrial adaptability.

5.2 Prospects

In the future, the outcomes of this research will be fully implemented in the cultivation of professional degree postgraduates in engineering management at Hebei GEO University and will be progressively extended to engineering disciplines such as civil engineering and geological resources and environment, thereby promoting the overall reform of professional degree engineering education at the university. At the inter-university level, the constructed training mechanism and institutional documents possess strong replicability and can serve as a reference for the industry–education integration reform of professional degree programs in engineering management at local universities. At the policy level, the research findings can provide a basis for educational administrative departments to formulate policies related to industry–education integration, thereby contributing to the synergistic and high-quality development of regional higher education and the engineering construction industry.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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REFERENCES

[1] Xie Xiyao, Chen Weiwei, Sun Fei, et al. Vigorously Promoting the Construction of a Modern Industrial System to Accelerate the Development of New Quality Productive Forces. Xinhua Daily Telegraph, 2024.

[2] Yang Jinwei, Liang Jiamei, Kan Baoxiao, et al. Construction Characteristics and Practical Pathways of the Quality Assurance System for Engineering Education in the United States. Research in Higher Engineering Education, 2026(02): 78–83.

[3] Lin Yaqiong, Dong Zishuo. Between Academia and Industry: A Case Study of Engineering Graduate Training at MIT from the Perspective of Entrepreneurial Science. University and Discipline, 2025, 6(01): 98–114.

[4] Lei Huan, Edward Crawley. Cultivating Engineering Leadership to Lead Global Development: An Overview of the MIT Gordon Engineering Leadership Program. Tsinghua Journal of Education, 2010, 31(01): 77–83+92.

[5] Zhang Jingxiao, Liu Xin, Liu Jiayu, et al. Teaching Design and Practice for Engineering Management Majors in Engineering Practice Scenarios: A Case Study of MEM Postgraduates at Chang'an University. Research in Higher Engineering Education, 2026(03): 159–64.

[6] General Office of the State Council. Several Opinions on Deepening Industry–Education Integration. Gazette of the Ministry of Education of the People's Republic of China, 2017(12): 2–9.

[7] National Development and Reform Commission, Ministry of Education, Ministry of Industry and Information Technology, Ministry of Finance, Ministry of Human Resources and Social Security, State-owned Assets Supervision and Administration Commission of the State Council. Notice on Issuing the Pilot Implementation Plan for National Industry–Education Integration Construction. Gazette of the Ministry of Education of the People's Republic of China, 2019(10): 15, 1–9.

[8] Leading Group for Education Work of the CPC Central Committee. Action Plan for Adjusting and Optimizing the Setting of Higher Education Disciplines (2025–2027). Chinese Talent, 2025(09): 5.