

Triple Synergy: Policy Design, Technological Pathways, and Regional Adaptation of University-Industry Collaboration in Ethnic Minority Areas-A "Three-Campus" Perspective

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Abstract: University–industry collaboration (UIC) in regions characterized by significant cultural diversity often faces persistent challenges arising from institutional fragmentation, limited resources, and socio-cultural mismatch. This study develops an integrated analytical framework that introduces the concept of “three campuses”—cross-sector, cross-region, and cross-mode—to examine the multidimensional coupling of policy, technology, and culture, as well as the coordinated interaction among government, industry, universities, and local communities. Drawing on a systematic review of domestic and international literature, the study identifies key gaps in existing research and demonstrates how the three-campus model can reshape organizational boundaries, mobilize spatial and institutional resources, and enhance collaboration through digital and intelligent tools. The findings further present a dynamic loop illustrating how the three campuses interact through a progressive sequence of organizational restructuring, resource expansion, and intelligent augmentation to promote sustainable UIC in regions marked by cultural and developmental diversity. This framework provides theoretical and practical insights for policymakers and institutional leaders seeking to strengthen regional adaptability and support long-term collaborative innovation.

Keywords: university-industry collaboration; three-campus model; policy-technology-culture coupling; quad-helix synergy; literature review

1. Introduction

University-industry collaboration has become a central approach for strengthening regional innovation systems and advancing sustainable development in knowledge-based economies. In China's ethnic minority regions, however, such collaboration encounters a distinctive set of structural constraints, including geographical isolation, cultural divergence, institutional misalignment, and long-standing development disparities [1]. These regions span vast areas with unique cultural heritage and ecological significance, presenting both challenges and opportunities for creating mechanisms capable of effectively linking academic knowledge generation with industrial application.

The relevance of this study lies in addressing the persistent development gap between ethnic minority regions and the more economically advanced coastal areas. Although national policies have emphasized regional coordination and shared development, successful UIC in these areas requires approaches that reflect their specific conditions, institutional characteristics, and development trajectories [2]. Previous research has explored industry-education integration and regional innovation systems, yet few studies propose a comprehensive framework that simultaneously incorporates organizational, spatial, and technological dimensions within a governance structure capable of adapting to diverse cultural environments.

Published: 24 November 2025



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Internationally recognized frameworks such as the Triple Helix and Quadruple Helix highlight the importance of multi-stakeholder interaction in innovation ecosystems. While these models provide valuable theoretical foundations, they require contextual adaptation when applied to the socio-cultural and geographical conditions of China's ethnic minority regions [3]. Within the Chinese setting, additional conceptual tools-such as the "three campuses" model, consisting of cross-sector (kua jie), cross-region (kua qu), and cross-mode (kua xian) forms of collaboration-offer a distinctive analytical perspective for examining how UIC can be reorganized across institutional domains, spatial boundaries, and hybrid digital-physical environments [4].

This paper responds to existing theoretical and practical gaps by developing an integrated model of three-campus synergy, focusing on policy design, technological pathways, and cultural adaptation in ethnically diverse contexts. Drawing on a systematic review of domestic and international literature, the study presents a comprehensive framework intended to support policymakers, higher education institutions, and industry partners in constructing more effective and sustainable collaboration strategies for ethnic minority regions.

2. Theoretical Foundations and International Perspectives

2.1. Cross-Sector Collaboration and Organizational Innovation

The conceptual basis of cross-sector campus models draws significantly from global research on boundary-spanning mechanisms and hybrid governance structures within innovation systems. Foundational studies in this area highlight how universities, industries, and governments increasingly interact in dynamic and mutually influential ways. This line of scholarship emphasizes that traditional institutional boundaries are becoming more permeable, facilitating the emergence of hybrid organizations and collaborative networks capable of strengthening knowledge production and innovation capacity across sectors.

Subsequent developments extend this framework by positioning civil society as an essential component of innovation ecosystems, thereby forming a four-dimensional structure of interaction among government, industry, academia, and community stakeholders. This perspective resonates strongly with China's emphasis on "4D synergy" (zheng-chan-xue-she), which underscores the role of community engagement and cultural inclusiveness in determining the effectiveness of collaborative initiatives. It also highlights the principle that sustainable innovation requires technological advancement and economic feasibility, as well as social endorsement and cultural alignment.

Within the Chinese context, recent analyses demonstrate how emerging productive forces are reshaping the structure of industry-education collaboration and driving cross-sector reorganization in response to technological change and economic restructuring [5]. This research illustrates how institutional boundaries are being recomposed into flexible and adaptive collaboration mechanisms. Complementary sectoral case studies provide practical evidence from domains such as cross-border e-commerce and artificial intelligence talent development, showing that institutional hybrids-including industry-academy consortia-create shared value through pooling resources, sharing risks, and integrating complementary capabilities [6,7].

The cross-sector campus model can therefore be understood as an organizational innovation designed to promote knowledge flow, resource mobility, and capability development across institutional spheres. It responds directly to the challenge of reconciling differing time horizons, performance expectations, and operational logics between academic institutions and industrial enterprises. By establishing intermediary structures that translate across institutional logics, cross-sector campuses help reduce transaction costs and enhance the overall efficiency of collaboration.

2.2. Cross-Region Collaboration and Spatial Integration

The theoretical foundation for cross-region collaboration is supported by influential work in economic geography and regional innovation studies. A key contribution to this field proposes that effective regional innovation depends on both localized networks that facilitate tacit knowledge exchange and broader external linkages that provide access to codified knowledge and external markets [8]. This framework offers a compelling rationale for structured cross-region collaboration. For ethnic minority regions where innovation ecosystems are often thin and local networking opportunities are limited, building strong external linkages becomes particularly important.

Cross-region campuses serve as institutionalized pipelines that systematically introduce external knowledge, technologies, and expertise into local innovation systems. This spatial integration function aligns with broader research on cross-border education, which identifies the importance of maintaining quality standards while responding to local conditions [9]. Key success factors for such collaboration include mutual recognition of qualifications, alignment of standards, and the establishment of joint governance mechanisms.

In China's ethnic minority regions, cross-region models have been implemented through various policy instruments such as digital pairing assistance (*duikou zhiyuan*) and cooperative economic arrangements intended to strengthen linkages between more developed regions and less advantaged minority areas. These initiatives aim to overcome structural constraints by constructing channels for knowledge transfer, technology dissemination, and capacity building. Research on vocational education further shows how targeted interventions contribute to reducing regional disparities and supporting broader goals of spatial equity in national development strategies.

The spatial dimension of innovation collaboration is further shaped by the geographical realities of many ethnic minority regions, which may include mountainous terrain, deserts, or borderlands that limit physical connectivity. Consequently, digital platforms and virtual collaboration modes become essential tools for enabling knowledge exchange and project coordination. These technologies help transform geographical challenges into opportunities for designing innovative collaboration models that leverage digital connectivity to mitigate spatial limitations.

2.3. Cross-Mode Collaboration and Digital Transformation

The development of cross-mode campuses draws on the extensive literature on digital transformation in education and innovation systems. This paradigm focuses on the integration of physical and digital learning environments supported by emerging technologies such as artificial intelligence, virtual reality, augmented reality, and adaptive learning systems. The underlying theoretical premise is that digital technologies are not simply instruments for efficiency improvement but transformative forces capable of reshaping educational practices, research interactions, and knowledge-sharing mechanisms.

Meta-analytical studies provide robust evidence demonstrating the positive impacts of AI-enhanced learning systems on engagement, knowledge acquisition, and skills development in diverse educational settings [10,11]. These studies also emphasize that the effectiveness of AI-enabled environments depends on pedagogical design, institutional capacity, and adequate teacher preparation, cautioning against assumptions that technology alone can produce meaningful improvement.

Critical reviews of AI applications in higher education highlight the limits of technology-centered approaches and the risks of overlooking the essential roles of educators in guiding learning processes [12]. This research underscores the need for models that integrate technological innovation with pedagogical expertise, recognizing that successful digital transformation requires re-envisioning human roles rather than replacing them.

Within the Chinese context, evaluation frameworks have been developed to systematically assess the quality of digitally supported teaching, taking into account institutional resources, teacher digital literacy, and student readiness [13,14]. Practical applications of industrial digital technologies in education—such as the integration of Building Information Modeling (BIM) into construction-related curricula—provide concrete examples of how digital tools can enhance professional training and workforce preparedness [15].

The cross-mode campus concept transcends simple technology adoption by reimagining how university-industry collaboration can take place in digitally mediated environments. It recognizes that digital technologies enable new modes of cooperation unconstrained by traditional spatial and temporal boundaries, while simultaneously introducing challenges related to digital divides, data management, and technological dependence that must be carefully addressed.

3. An Integrated Framework: The Three-Campus Synergy Model

Building on the preceding theoretical foundations and international perspectives, this section proposes an integrated three-campus synergy model that operates through a reinforcing feedback loop shaped by two core mechanisms: 3D coupling (policy-technology-culture) and 4D synergy (government-industry-university-society). This framework adopts a dynamic systems perspective on university-industry collaboration in ethnic minority regions, emphasizing how the three collaboration dimensions intersect and how new system-level properties emerge from their continuous interaction.

The Cross-Sector Campus forms the organizational foundation of this model by establishing hybrid structures—such as joint institutes, cooperative research centers, and industry-academy alliances—that stabilize collaboration across institutional boundaries. These organizational arrangements provide the governance structures, incentive mechanisms, and coordination procedures necessary to support sustained cooperation among entities with differing missions, cultures, and performance metrics. In essence, the cross-sector campus generates “collaborative advantage” by integrating complementary resources and capabilities while harmonizing organizational differences and ensuring alignment in multi-actor collaboration [16].

Parallel to this organizational dimension, the Cross-Region Campus functions as the spatial lever that mobilizes knowledge, technology, capital, and talent across geographical divides. This spatial mechanism is particularly critical for ethnic minority regions, where resource scarcity and uneven development often hinder innovation capacity. By constructing structured channels that connect peripheral areas with innovation centers, the cross-region campus transforms the periphery into a “connected periphery” characterized by strong horizontal and vertical linkages. Resource circulation occurs through both physical mobility—such as expert exchanges, student mobility programs, and temporary project deployments—and virtual connectivity, including digital collaboration platforms, remote supervision systems, and online knowledge repositories. Through these pathways, spatial integration becomes a driver of regional adaptability and capability formation.

Completing the triadic structure, the Cross-Mode Campus serves as the technological engine that enhances the efficiency, reach, and flexibility of collaboration by integrating intelligent tools and blended environments. This technological dimension acknowledges that digital transformation involves more than adopting advanced tools; it requires a reconfiguration of collaboration processes, knowledge flows, and interaction structures. The cross-mode campus creates “digital leverage” by using technology to amplify limited resources, extend the impact of collaboration initiatives, and ensure the adaptability of models to distinct local contexts. Examples include the use of digital twins for remote operation of specialized equipment, virtual reality environments for applied skills

training, and AI-enabled platforms for matching industrial problems with academic expertise.

As illustrated in Figure 1, the three campuses interact through a virtuous cycle characterized by the progression: Organizational Restructuring → Resource Expansion → Intelligent Augmentation. Each iteration of this cycle strengthens university-industry collaboration through improved coordination, enhanced learning, and greater system resilience. Organizational restructuring initiated by the cross-sector campus establishes the institutional foundation necessary for more effective resource expansion via cross-region initiatives. The resulting increase in resource diversity and scale then justifies further investment in intelligent augmentation through cross-mode technologies. This technological enhancement, in turn, enables more sophisticated forms of organizational restructuring, creating an upward spiral of collaborative capability.

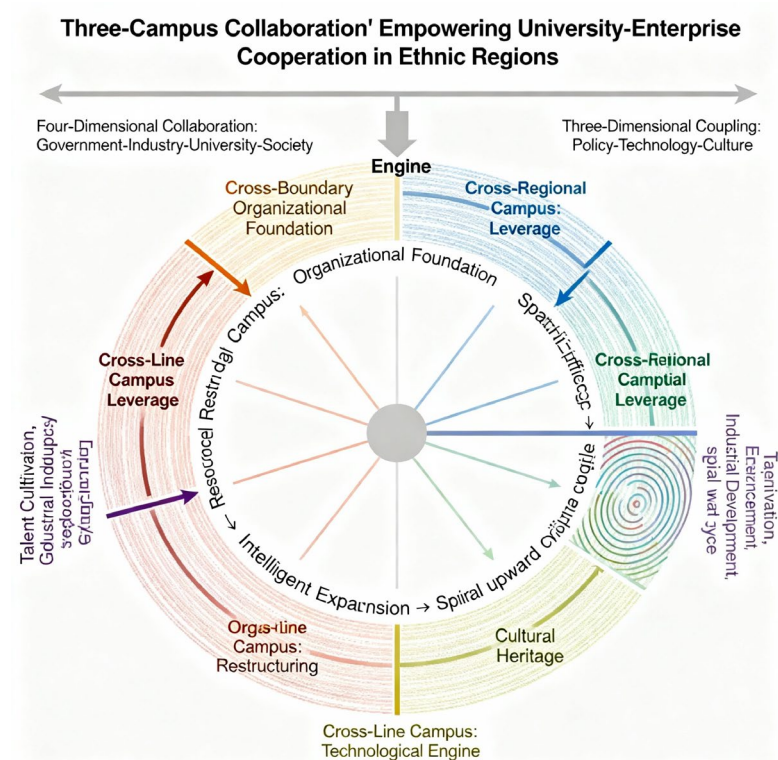


Figure 1. The "Three-Campus" Synergy Model for University-Industry Collaboration in Ethnic Minority Regions.

This dynamic interaction unfolds within the overarching framework of 3D coupling, which ensures that interventions are politically feasible, technologically practical, and culturally aligned. The policy dimension focuses on regulatory design, funding models, and accountability systems that encourage and sustain collaboration. The technology dimension ensures that solutions are advanced yet adaptable, capable of addressing context-specific constraints. The culture dimension highlights trust-building, value alignment, and meaning-making as essential but often overlooked conditions for successful collaboration among diverse stakeholders.

At the same time, the 4D synergy mechanism-government, industry, university, and society-provides the stakeholder architecture through which the collaboration ecosystem functions. Government evolves into an enabling actor that creates supportive conditions while safeguarding public interests. Industry contributes real-world challenges, applied expertise, and market-oriented discipline. Universities supply knowledge creation, analytical capacity, and talent development. Society-especially local communities in ethnic minority regions-ensures that collaborative initiatives remain connected to local

needs, values, and aspirations, thereby providing the social legitimacy required for sustainable innovation activities.

4. Discussion: Implications for Ethnic Minority Regions

The implementation of the three-campus model in ethnic minority regions requires careful attention to local cultural, economic, and ecological specificities. These regions possess distinctive characteristics that shape how university-industry collaboration models should be designed, adapted, and operationalized. The following discussion examines the major implications for tailoring the three-campus approach to these contexts, acknowledging both the opportunities it creates and the challenges it must overcome.

Cultural appropriateness is a decisive factor influencing the success of cross-sector collaboration in culturally diverse regions. Organizational structures and governance mechanisms that function effectively in mainstream contexts may require significant adaptation to align with local cultural norms, decision-making traditions, and relationship-building practices. In areas where traditional community or local governance structures play a prominent role, collaboration mechanisms may need to operate alongside these systems in addition to formal institutional frameworks. Furthermore, communication patterns, approaches to resolving differences, and expectations regarding leadership can differ markedly from mainstream models, making culturally responsive collaboration protocols essential.

Cross-region initiatives must also avoid the risk of transplanting external models without adequate localization. Sustainable cross-region collaboration depends on fostering endogenous development, supporting community participation, and encouraging innovation rooted in local values rather than imposing standardized solutions [17]. This requires what can be described as "culturally literate intermediation," a capacity to translate across different knowledge systems, value orientations, and operational logics while respecting the integrity of each. For instance, indigenous knowledge should be viewed as a complementary asset rather than a peripheral consideration, enabling hybrid innovation approaches that integrate both traditional and scientific knowledge systems.

The digital dimension adds further layers of complexity, particularly regarding technological appropriateness and digital inclusion. Cross-mode tools must be designed with explicit consideration of the digital divide commonly found in ethnic minority regions, including constraints in connectivity infrastructure, affordability of digital devices, and varying levels of digital literacy [18]. Technology solutions that assume high bandwidth, costly equipment, or advanced technical skills may unintentionally deepen inequalities instead of closing gaps. Therefore, appropriate technology strategies should prioritize robustness, affordability, ease of use, and offline capability where necessary to ensure broad accessibility.

Language diversity presents another central challenge, especially for digital platforms and educational resources. Many communities in ethnic minority regions rely more comfortably on local languages than on Mandarin Chinese, making multilingual interfaces, translated materials, and culturally contextualized examples indispensable [19]. The associated costs and operational complexities must be integrated into the planning of cross-mode initiatives to ensure that linguistic barriers do not exclude the very groups these tools are meant to benefit.

Policy frameworks supporting the three-campus model in ethnic minority regions must incentivize place-based innovation that aligns national priorities with grassroots needs [20]. This calls for flexible policy instruments capable of accommodating significant regional variation while maintaining accountability for outcomes. Conventional one-size-fits-all approaches frequently underperform in such contexts due to their distinctive geographical, cultural, and historical attributes. In contrast, adaptive policy frameworks

that specify clear goals while allowing diverse implementation pathways are better suited to local realities.

Cross-sector governance mechanisms also need to integrate traditional knowledge and local value systems to enhance trust, legitimacy, and sustainability. Hybrid governance structures that include both formal institutional actors and traditional community leaders enable decision-making processes that honor bureaucratic procedures while remaining responsive to cultural norms. Such inclusive governance enhances the perceived legitimacy of collaboration initiatives and improves their operational effectiveness by drawing on deep local knowledge and social networks.

Finally, economic sustainability remains a major concern for implementing three-campus models in the often less-developed regions where ethnic minority communities are located. Traditional market-driven approaches may be insufficient because of thinner markets, lower purchasing power, and elevated transaction costs. Innovative financing mechanisms—such as public-private-community partnerships, cross-subsidization strategies, or integration with broader rural revitalization efforts—may be required. Sustainable business models must reflect the distinctive economic structures of these regions while offering clear and equitable value propositions for all stakeholders.

5. Conclusion and Future Research

This study has proposed an integrative framework for understanding and advancing university-industry collaboration in China's ethnic minority regions by combining the three-campus model with 3D coupling and 4D synergy perspectives. The framework underscores the importance of systemic interaction across organizational, spatial, and technological dimensions, moving beyond fragmented approaches that target only isolated aspects of collaboration.

The three-campus model provides a comprehensive pathway for addressing the complex challenges of collaboration in culturally diverse regions. By emphasizing cross-sector organizational innovation, cross-region resource coordination, and cross-mode technological enablement, the model offers a holistic structure for designing interventions capable of overcoming the limitations of traditional, siloed strategies. The interdependence among these three dimensions generates synergistic effects that enhance the sustainability, inclusiveness, and overall effectiveness of collaboration initiatives.

Several avenues for future inquiry arise from this work. First, empirical investigations are needed to test, validate, and refine the three-campus model across regions characterized by cultural and geographic diversity. Comparative studies in areas with distinct ecological, economic, and cultural conditions would illuminate how local factors shape model implementation. Such studies should examine not only successful experiences but also partial or less successful attempts, as these provide critical insights for improving model design and adaptability.

Second, the development of rigorous evaluation metrics and assessment frameworks represents another key research priority. Existing evaluation systems frequently emphasize quantifiable indicators while overlooking deeper processes such as institutional learning, relationship development, and capability enhancement. Future research should focus on constructing mixed-methods evaluation tools capable of capturing both measurable outcomes and the intangible, process-oriented elements essential for long-term collaboration success.

Third, the rapid advancement of digital technologies, including generative artificial intelligence, calls for continued research into how these tools reshape cross-mode collaboration. Future studies should examine how technology can augment rather than displace human relationships, particularly in cultural contexts where interpersonal connections carry significant weight. Relevant research directions include appropriate technology design for culturally diverse settings, strategies to ensure digital inclusion in

underserved communities, and ethical guidelines for digital applications in culturally sensitive environments.

Fourth, comparative international research that evaluates the three-campus model alongside innovation frameworks used in other regions with marginalized or indigenous populations could yield important cross-context insights. Comparative studies involving cases from Canada, Australia, Norway, and New Zealand may help identify shared principles while revealing context-specific considerations. Such research would situate the three-campus model within broader global discussions on inclusive innovation and regional development.

Finally, implementation-oriented research is essential for addressing the practical challenges involved in operationalizing the three-campus model. Future studies should explore institutional change strategies, capacity-building approaches for enhancing collaboration competencies, and mechanisms for managing conflict in cross-cultural environments. These lines of inquiry would provide actionable guidance for both policymakers and practitioners seeking to translate theoretical frameworks into sustainable practice.

In conclusion, the three-campus model offers a promising and adaptable framework for strengthening university-industry collaboration in China's ethnic minority regions. By adopting an integrative and context-responsive approach, stakeholders can harness the potential of UIC to support economic development while maintaining cultural continuity. The model's emphasis on systemic thinking, dynamic interactions, and cultural grounding provides a strong foundation for further academic exploration and practical innovation in this important field.

References

1. Y. Bolan, and T. Mahmood, "Vocational education as a tool for socio-economic development: A case study of Wuling ethnic areas," *Pakistan Languages and Humanities Review*, vol. 7, no. 1, pp. 538-550, 2023.
2. Y. Chen, S. Li, and R. Chen, "Impact of Industry and Education Integration on Employment Quality in Higher Vocational Colleges: Moderating Role of Faculty Qualifications and Curriculum Development Capacity," *Education Sciences*, vol. 15, no. 10, p. 1316, 2025. doi: 10.3390/educsci15101316
3. H. Etzkowitz, and L. Leydesdorff, "The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university-industry-government relations," *Research policy*, vol. 29, no. 2, pp. 109-123, 2000. doi: 10.1016/s0048-7333(99)00055-4
4. K. Miller, R. McAdam, and M. McAdam, "A systematic literature review of university technology transfer from a quadruple helix perspective: toward a research agenda," *R&D Management*, vol. 48, no. 1, pp. 7-24, 2018.
5. Y. A. N. G. Xi, and L. U. O. Ming, "Research on the talent training mode of Application-oriented Undergraduate Cross-border e-commerce Innovation and Entrepreneurship Education," In *2020 International Conference on Big Data and Informatization Education (ICBDIE)*, April, 2020, pp. 119-122.
6. N. Hu, X. Meng, Y. Gao, and Z. Lu, "Exploring the Core Competence of Cultivating Applied Talents in Artificial Intelligence under the Background of Industry Education Integration," In *SHS Web of Conferences*, 2023, p. 05015. doi: 10.1051/shsconf/202317905015
7. H. Bathelt, A. Malmberg, and P. Maskell, "Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation," *Progress in human geography*, vol. 28, no. 1, pp. 31-56, 2004. doi: 10.1191/0309132504ph469oa
8. L. Onuoha, "Implementation of a Collaborative Relationship Model: An Opportunity for Increased Trust and Acceptance of Change by Full-Time Faculty and Administration (Doctoral dissertation, Northeastern University)," 2025.
9. M. Younas, I. Ismayil, D. A. S. El-Dakhs, and B. Anwar, "Exploring the impact of artificial intelligence in advancing smart learning in education: A meta-analysis with statistical evidence," *Open Praxis*, vol. 17, no. 3, pp. 594-610, 2025. doi: 10.55982/openpraxis.17.3.842
10. X. Wang, R. T. Huang, M. Sommer, B. Pei, P. Shidfar, M. S. Rehman, and F. Martin, "The efficacy of artificial intelligence-enabled adaptive learning systems from 2010 to 2022 on learner outcomes: A meta-analysis," *Journal of Educational Computing Research*, vol. 62, no. 6, pp. 1348-1383, 2024.
11. O. Zawacki-Richter, V. I. Marín, M. Bond, and F. Gouverneur, "Systematic review of research on artificial intelligence applications in higher education-where are the educators?," *International journal of educational technology in higher education*, vol. 16, no. 1, pp. 1-27, 2019.

12. H. Y. Wang, "of Integrated Education Mechanism of Industry and Education in Applied Undergraduate Colleges," In *Recent Trends in Educational Technology and Administration: Proceedings of the 2nd International Conference on Educational Technology and Administration*, June, 2023, p. 233.
13. J. Sun, and X. Yao, "Research on application-oriented undergraduate education based on the deep integration of industry and education," *International Journal of Education and Humanities*, vol. 3, no. 1, pp. 55-58, 2022. doi: 10.54097/ijeh.v3i1.513
14. F. Li, and D. Huang, "Study of Cultivating BIM Application-oriented Talents in Civil Engineering by Production-education Integration," In *3rd International Conference on Economics and Management, Education, Humanities and Social Sciences (EMEHSS 2019)*, June, 2019, pp. 32-35. doi: 10.2991/emehss-19.2019.7
15. D. Kong, "Research on the Talent Cultivation Model for Emerging Engineering Disciplines in Local Universities under the Context of Industry-Education Integration," 2024.
16. X. Ou, "Construction of a Long-term Application-oriented Talent Cultivation Mechanism for Universities in Jilin Province in the Context of Industry-education Integration [J]," *International Journal of Frontiers in Sociology*, vol. 2, no. 5, 2020.
17. K. Wang, F. Li, S. Yang, and Y. Luo, "Exploration and practice of teaching research and reform on echelon-based applied talent cultivation in the view of industry-education integration," *International Journal of Learning and Teaching*, vol. 10, no. 5, pp. 647-651, 2024. doi: 10.18178/ijlt.10.5.647-651
18. W. Zhao, "Innovation and practice of talent cultivation models in higher education from the perspective of industry-education integration," *Higher Education Practice*, vol. 10, p. h241515, 2024.
19. X. Jiang, X. Zhang, and P. Chen, "Study on the Talents Training Mode Promoting of the Integration of Industry and Education in Application-oriented Colleges and Universities," In *2019 International Conference on Management, Education Technology and Economics (ICMETE 2019)*, May, 2019, pp. 333-336. doi: 10.2991/icmete-19.2019.79
20. X. Xianhang, and Q. Min, "Research On The Talent Training Mode Of Applied Undergraduate Integration Of Industry And Education," *Book Rivers*, 2022.

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