

Models and Methodologies for the Establishment of "Dual Distinctive Characteristics" in Applied Undergraduate Institutions in Hubei Province

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Abstract: This study examines the "dual-characteristic" development of applied undergraduate institutions in Hubei Province. Guided by the strategic framework outlined in the Hubei Provincial Education Development Plan for the 14th Five-Year Period, it explores models and strategies for establishing distinctive universities and competitive major clusters aligned with regional industrial demands. The objective is to develop competitive major clusters that address the needs of Hubei's strategic emerging industries and key sectors, fostering innovative, applied, and interdisciplinary talent. Employing the "dual-characteristic" approach as a foundation and integrating research findings from both domestic and international scholars, this study investigates the current status of applied undergraduate institutions in Hubei Province concerning talent development models, university-industry collaboration, specialized curriculum development, and faculty teams with dual qualifications. The findings offer valuable insights for the specialized advancement of similar institutions.

Keywords: Applied Undergraduate Universities; Dual Characteristics; University-Enterprise Collaboration

1. Introduction

In 2015, the Ministry of Education, the National Development and Reform Commission, and the Ministry of Finance promulgated the "Guiding Opinions on Directing Certain Local General Undergraduate Institutions to Transition into Application-Oriented Institutions." This document formulated a top-tier university transformation and reform design, delineating pivotal tasks, supportive policies, and execution mechanisms for converting undergraduate institutions. It offers policy orientation and guidance for universities endeavoring to achieve distinctive and categorized development, motivating them to establish scientific positioning, foster unique strengths and rigorous standards, attain excellence in specific domains and directions, and investigate development models commensurate with their individual traits. The contemporary societal demand for applied talent persists and escalates, rendering the advancement of applied undergraduate education and applied talent development paramount. The "dual-characteristic" development not only aids universities in cultivating distinctive educational styles and competitive edges but also empowers them to accommodate diverse societal needs better, nurture more precisely targeted and competitive talent, and establish the groundwork for sustainable university development. In recent years, Hubei Province has experienced swift advancement in optoelectronic information, automobile manufacturing, and biomedicine, engendering a substantial demand for innovative, applied, and multidisciplinary talent. Nevertheless, certain universities encounter obstacles, including a lack of distinctive characteristics and insufficient depth in industry-education integration. Consequently, conducting in-depth research on the "dual-distinctive" development model and pathways for applied universities in Hubei possesses practical significance, providing theoretical backing and practical guidance to tackle these challenges.

2. Fundamental Concepts and Associated Policies About the "Dual Distinctiveness" Initiative

In its 2022 reply to the proposal titled "Reinforcing the Assessment of Social Contributions to Promote Local Universities' Contribution to Regional Economic and Social Progress," the Hubei Provincial Department of Education indicated that the "Dual Distinctiveness" program facilitates the

advancement of undergraduate institutions boasting unique characteristics and specialized program clusters that aptly cater to local economic and social progression. Through endorsing undergraduate universities with distinctive pedagogical attributes, the program endeavors to foster specialized program clusters that align with national strategies and Hubei's regional industrial growth, concurrently enhancing the digital capabilities of these specialized clusters.

Based on the 2015 top-level design framework for university transformation and development formulated by the Ministry of Education and other relevant departments, and in conjunction with Hubei's industrial upgrading requirements, the Hubei Provincial People's Government issued the "Hubei Provincial Education Development 14th Five-Year Plan" in 2021. This plan explicitly promotes applied universities' "dual-characteristic" development, which will persist until 2024. It undertakes the "dual-characteristic" construction project for applied undergraduate institutions, backing 23 undergraduate institutions with distinctive features to cultivate specialized clusters that cater to national strategies and regional industrial development in Hubei and reinforce the development of digital-enabled professional clusters. By 2025, this initiative will have established an implementation pathway of "targeted policy supply—university specialization positioning—industry demand alignment—digital technology empowerment," offering a "Hubei model" for the categorized, distinctive development of local universities nationwide.

3. Domestic and international research findings

Regarding industry-academia-research collaboration, foreign studies predominantly adopt practice-oriented approaches. Research by Vahid Garousi and colleagues in the field of software engineering indicates that university curricula must closely align with industry priorities to cultivate "plug-and-play" applied talents, thereby preventing academic-industrial disconnect^[1]. Thomas Gersdorf identifies resource constraints and complex administrative processes as primary barriers to university-industry collaboration, suggesting these can be addressed through enhanced communication and dynamic adaptation to evolving needs^[2]. Furthermore, Teresa Dieguez, using the Portuguese automotive industry partnership as a case study, confirms that establishing sustainable, trustworthy partnerships is crucial for achieving risk-sharing and cost reduction, regardless of the collaboration model^[3]. In contrast, domestic research primarily offers frameworks for evaluating "dual-characteristic" development, talent cultivation, and curriculum reform. For instance, Zhen Xu proposed an evaluation system for environmental design programs under this framework^[4]; Ruoyi Guo explored talent development objectives and curriculum optimization for new business disciplines^[5]; while Jingdong Li et al. emphasized field-based teaching methods for ideological and political courses^[6]. However, existing research still lacks sufficient attention to key mechanisms such as "university-enterprise collaboration" and "industry-education integration." Therefore, higher education institutions in Hubei Province need to anchor themselves to regional pillar industries, establish a "specialty cluster-industrial chain" alignment mechanism, and maximize the advantages of university-enterprise collaboration through corporate partnerships and curriculum optimization.

4. Investigation of the "Dual-Characteristic" Development Paradigm for Applied Undergraduate Institutions in Hubei Province

4.1 Constructing a Cooperation Mechanism of "Local Enterprises + Characteristic Disciplines"

The establishment of this cooperative mechanism prioritizes precise alignment, matching the core disciplinary strengths of universities with the needs of local enterprises. Taking Hubei University of Automotive Technology as an example, the institution leveraged its automotive expertise to partner with leading local companies like Dongfeng Motor Corporation. This collaboration established the Wuhan Industry-Academia-Research Base and new colleges such as the Intelligent Connected Vehicle College, creating an innovative ecosystem for student internships, employment, and research. To achieve efficient coordination, dedicated university-enterprise cooperation management bodies should be established to oversee project planning, implementation, and evaluation, ensuring the smooth operation of the cooperation mechanism^[7]. Finally, practical teaching components must be strengthened. This can be achieved through establishing off-campus practice bases, inviting corporate technical personnel to serve as adjunct faculty, and integrating real-world projects into the classroom, thereby effectively enhancing students' practical skills and professional competence.

4.2 Constructing a Dynamic and Adaptive Talent Development Standard System with Market Demand as the Core

Over recent years, Hubei Province has experienced swift expansion in burgeoning sectors, including the digital economy, biomedicine, and artificial intelligence. These domains are distinguished by their interdisciplinary and all-encompassing attributes, fostering a persistent demand for composite talents and professionals skilled in technology application. To effectively manage this dynamic market landscape, applied undergraduate institutions formulate their talent development criteria based on three foundational elements: demand orientation, dynamic responsiveness, and feedback-informed enhancement. This establishes a beneficial cycle of "market demand — training system — industrial development." Demand-oriented strategies precisely define training goals, dynamic responsiveness guarantees alignment between the training process and market fluctuations, and feedback-informed enhancement consistently refines the training system. This synergistic strategy drives both universities and industries toward superior development.

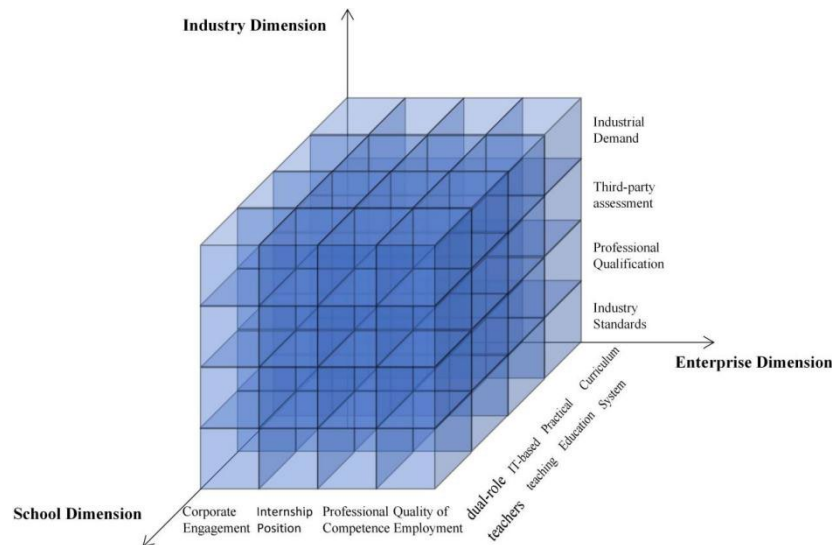


Figure 1: Three-Dimensional Evaluation System

Market demand is met by constructing an industry talent database via sectoral research, corporate collaborations, and graduate tracking. The training framework incorporates corporate involvement in curriculum formulation, course creation, and textbook development, integrating enterprise technical standards^[8]. Leveraging a three-dimensional evaluation system that encompasses educational institutions (theory and practice), enterprises (internship competencies), and industries (skill certification) (Figure 1), employment quality is monitored through big data analytics or third-party evaluations (e.g., MyCOS) to facilitate iterative enhancements in training initiatives. This approach fosters holistic development in industrial talent demand, technological innovation, structural optimization, and regional coordination.

4.3 Concentrating on the Development of Dual-Qualified Faculty to Promote Industry-Education Integration

The dual-qualified faculty is pivotal to ensuring the quality of talent cultivation systems. First, a scientific evaluation and incentive system must be established, moving beyond single-dimensional assessment models. Practical achievements and contributions to industry-education integration should be incorporated into evaluations, supplemented by multi-stakeholder feedback from peers, students, and enterprises. Concurrently, priority should be given to dual-qualified faculty in professional title evaluations. Second, clearly defined objectives must align teacher development with market demands. Institutions should cultivate faculty who can both teach theory and solve practical technical problems, focusing on local industries. For instance, through our collaboration with Dongfeng Logistics (Xiangyang) Co., Ltd., we implemented a tiered engineering practice program for young faculty—short-term exposure, mid-term projects, and long-term transformation—facilitating their transition from "academic researchers" to "practical educators." Regarding university-enterprise collaboration, institutions and companies can jointly develop curricula, establish shared training bases, and facilitate two-way personnel mobility. Corporate technical experts can serve as adjunct lecturers,

bringing frontline experience, while university faculty can engage in enterprise R&D, achieving resource sharing and complementary strengths.

4.4 Micro-majors: A Novel Impetus for the Optimization of Curriculum Systems and Learning Outcomes

The Hubei Provincial Department of Education advocates that universities investigate the "micro-major" paradigm as a pivotal approach to deepen industry-education integration and nurture multifaceted talents. In 2022, Hubei promulgated the "Implementation Opinions on Accelerating the Reform and Development of Higher Education in the New Era," explicitly endorsing universities in initiating interdisciplinary micro-courses and micro-majors. Since Wuhan University of Science and Technology pioneered four micro-specialty talent cultivation projects in 2021, leading universities across Hubei have sequentially launched micro-specialty construction endeavors. Concise, targeted curricula characterize these micro-specialties and exhibit substantial efficacy in fostering interdisciplinary integration, optimizing course frameworks, and facilitating university-enterprise cooperation. Ling Yan et al, posited that micro-majors employ practical projects as vehicles, enabling students to comprehensively apply acquired knowledge to solve real-world problems during project execution, cultivating practical skills, teamwork, and innovative thinking^[9]. By concentrating on core knowledge and skills in specific domains and eliminating superfluous content from traditional majors, students efficiently acquire essential knowledge within a condensed timeframe, facilitating concentrated, in-depth learning and augmenting learning efficiency. Regarding curriculum design, micro-specialization education adopts a multidisciplinary collaborative training model. It institutes interdisciplinary courses that facilitate cross-disciplinary integration. By amalgamating knowledge from domains such as internet technology, IoT technology, and information technology, it furnishes students with broader intellectual perspectives and richer cognitive approaches, enabling them to address complex problems arising in diverse fields more effectively.

5. Approaches to Fostering Dual Distinctive Characteristics in Hubei's Applied Undergraduate Institutions

Based on case studies from Hubei's applied undergraduate institutions, the developmental pathway for establishing dual distinctive features should revolve around "aligning academic majors with industries, courses with job functions, and research with practical demands." Through collaborative efforts among government, universities, and enterprises, along with profound integration of industry and education, a virtuous circle should be established wherein "distinctive majors bolster distinctive industries, and distinctive industries foster distinctive majors." This will ultimately accomplish the dual objectives of elevating the quality of talent cultivation and propelling high-caliber regional economic development.

5.1 Formulating Enterprise-Commissioned Programs to Promote Industry-Education Integration

Table 1: Implementation Schedule for the "321" Phased Order-Based Training Model

Phase	Time	Order Type	Training Objectives	Corporate Participation Method
Phase 3	Semesters 1-3	Large-scale Orders (Industry-focused)	Master foundational skills and establish career awareness	Companies provide industry lectures and short-term internships
Phase 2	Semesters 4-5	Medium-scale Orders (Enterprise-focused)	Reinforce job-specific skills, adapt to corporate needs	Companies provide customized courses, project-based training
Phase 1	Semester 6	"Small-scale orders" (targeted at specific companies)	Achieve "zero-distance" job placement	Companies provide real-world positions, sign employment agreements

A phased order-signing framework should address the constraints inherent in conventional order-based educational models, including fluctuating enterprise requirements, constrained student career pathways, and tardiness in curriculum revisions. The dynamic order mechanism leverages phased agreements to incrementally refine employment trajectories in alignment with students'

developmental progress and evolving corporate demands^[10]. This study implements a "321" phased cultivation model, with detailed execution procedures delineated below (Table 1).

Large-scale employment accords are executed at enrollment, without obligating students to particular enterprises. In their second and third academic years, students opt for specialized pathways per their interests and enter into medium-scale accords with 2-3 enterprises within the same industry. Six months before graduation, students formalize employment contracts with enterprises after successfully passing internship evaluations. Enterprises can modify recruitment quotas in response to requirements, circumventing premature commitment to a sole employer. This approach safeguards opportunities for career exploration, diminishes the risk of corporate non-compliance, and augments student autonomy in decision-making.

5.2 Accurately Identifying "Micro-Major" Orientations to Enhance Curriculum Frameworks

The accurate positioning of micro-majors should align with the requirements of local pillar industries or emerging strategic industries. Universities should construct competency-focused curriculum systems by organizing introductory, core, and integrated practice courses according to competency elements. This guarantees that curriculum content is closely aligned with industry demands. Educators must ensure a smooth progression and continuity from introductory classes to core subjects and comprehensive practice modules to establish a coherent knowledge framework. This collectively fosters students' professional knowledge and skill sets, empowering them to enhance practical operational abilities through hands-on training after acquiring theoretical foundations. Institutions need to identify micro-specialization themes, consistently monitor changes in industry demands and technological trends, and swiftly update course content to expedite curriculum renewal. They should also incorporate emerging technologies and research outcomes into coursework, providing students with advanced industry knowledge and skills while preserving the timeliness and practicality of micro-specialization programs.

5.3 Implementing "Three-Determined" Management in Faculty's Industrial Practice to Enhance the Development of Dual-Qualified Faculty

To efficiently promote the construction of a dual-qualified teacher team, it is suggested that a "three-fixed" management model centered on "setting goals, setting tasks, and setting evaluations" be systematically introduced. This model first requires the precise setting of practical goals, that is, to clarify the skill demands of enterprises through detailed industry research, and arrange for teachers to go to enterprises for short-term internships and project participation. At the same time, invite enterprise experts to provide collaborative guidance to ensure that the practical goals are both scientific and feasible. On this basis, it is necessary to clearly implement specific tasks and promote the in-depth integration of teachers into the operation of enterprises. This requires universities and enterprises to establish stable cooperative relationships. By regularly releasing project demands, organizing teacher connections, and requiring teachers to complete and submit high-quality practical research reports, it is ensured that practical achievements can effectively feed back to teaching and research. Ultimately, establishing a multi-dimensional assessment mechanism is the key to ensuring the effectiveness of practice. The core lies in comprehensively evaluating the specific achievements that teachers have made in enterprises, as well as the enterprises' evaluations of their work attitudes and professional capabilities. The teaching transformation of practical achievements should be officially incorporated into the performance evaluation system, thereby forming a powerful closed-loop incentive and comprehensively enhancing the industry-education integration capabilities of the teaching staff.

5.4 Constructing a Resource-Sharing Platform to Improve the Efficiency of Multi-Party Collaboration

In 2016, Hubei University of Automotive Technology, Hubei University of Science and Technology, and other institutions jointly established the Hubei Provincial Alliance of Applied Universities. By 2025, the alliance had expanded to 32 member universities and incorporated five partner organizations, including the Zhibo Shangshu Branch of Water Resources and Hydropower Press and Newway Technology Co., Ltd. This has formed a collaborative organization centered on applied universities, encompassing research institutions and industry enterprises. The Alliance is committed to implementing national and provincial policies promoting the transformation of local undergraduate institutions into applied-oriented universities. With enhancing talent cultivation quality as its core

objective, it drives industry-education integration and multi-party collaboration to serve Hubei's economic and social development. Regarding resource sharing, the Alliance has established a unified course resource platform. It encourages member institutions to upload high-quality courses, enabling cross-campus course selection and broadening students' learning pathways. Simultaneously, it has established a faculty exchange mechanism supporting cross-institutional teaching and lectures. The alliance also jointly implements a "dual-qualified" faculty training program, inviting industry experts to participate in teaching to enhance educators' practical instructional capabilities.

Furthermore, the alliance actively promotes the establishment of joint industry-university practice bases and establishes a shared practical resource mechanism, providing students with more internship and practical opportunities. Through jointly conducting practical projects and co-designing teaching content, it has effectively enhanced students' practical skills and innovative qualities.

6. Conclusions

In summary, the "dual-characteristic" development initiative at applied undergraduate institutions in Hubei Province has closely aligned with local industrial needs. Through measures such as university-enterprise collaboration, curriculum optimization, and the cultivation of dual-qualified faculty, it has effectively integrated talent cultivation with regional economic development. Despite challenges including rapidly evolving industrial demands and imperfect cooperative mechanisms, future efforts must persist in pursuing distinctive development paths. This involves deepening industry-education integration and optimizing resource sharing to better serve regional and national strategies, thereby steadfastly advancing the cultivation of high-quality applied talent.

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