UDC 331.1:658.3.07

RESEARCH ON THE TALENT SUPPLY MODEL AND EFFECTIVENESS OF INDUSTRY-EDUCATION INTEGRATION TRAINING BASES IN CHINA

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Abstract. This paper interrogates the internal logic and implementation effectiveness of the "industry – education – research" (I-E-R) integrated talent-supply base as a novel channel of human-resource provision, aiming to efficiently cultivate and deliver suitable personnel for enterprises. Grounded in corporate human-resource development and management, the study synthesis resource-dependence theory, human-capital theory and competency modelling to construct an analytical framework that encompasses "supply model – delivery path – effectiveness evaluation". The research furnishes both theoretical support and practical guidance for firms to strategically leverage I-E-R resources and optimize their talent-supply chains.

Keywords: "industry – university – research" integration, talent-supply base, talent supply, talent-supply chain, competency-based effectiveness evaluation.

"Industry – education – research" integration – driven by technological revolutions, industrial transitions, economic restructuring and international cooperation - has evolved into a pivotal strategy for enhancing talent competitiveness, upgrading industries and achieving sustainable development. At present, the foundation of IUR integrated training in China is confronted with three major challenges. Firstly, at the source of talent cultivation, there is a tendency to over-rely on a single model such as the "order-based" model. Although this model ensures the accuracy of talent supply to a certain extent, its inherent rigidity limits the cultivation of students' comprehensive abilities and the flexibility of career choices, making it difficult to meet the demand [1] for compound and innovative talents in the rapidly changing industrial ecosystem. Secondly, most industry-education integration in China remains at the level of internship cooperation;

enterprises mostly act as providers of internship positions, without participating in the formulation of curriculum design and assessment standards, resulting in a lack of process assessment and practical ability evaluation, and the assessment is still limited to the theoretical level. Thirdly, teacher training is mostly in the form of short-term lectures, without entering enterprises for practice, which leads to a gap between classroom teaching content and actual work situations.

As a pivotal platform bridging education and industry as well as theory and practice, training centers exert significant influence on the quality of human-resource development and on the optimization of talent structure. Optimizing their operational models can effectively align the education chain, the talent chain and the industrial chain, thereby laying a solid foundation for high-quality development and the national strategy of building a human-resource powerhouse [4].

Firms depend on the external environment to secure high-quality human resources; establishing training centers in cooperation with universities constitutes a strategic move to reduce the uncertainty of talent supply and to stabilize the talent pool [1].Saito and Goodman, adopting an organizational-learning perspective, further demonstrate that the essence of building an efficient university–industry alliance lies in lowering collaborative uncertainty through resource integration – a logic that is highly congruent with the above strategic initiative [3].

The foundation of «industry-university-research» integrated training should be oriented to the real demands of industrial positions to ensure precise alignment between cultivated talent and sector-specific competency standards. The model emphasizes that talent development should concentrate on the specific Knowledge, Skills and Abilities (KSAs) required by corporate posts rather than on generic theoretical knowledge [5]. Empirical work by Lawson and Salter reveals that firms which regard universities as a key source of innovation are more inclined to adopt position-based competency modelling in talent cultivation, furnishing practical evidence for a competency-oriented approach to I-E-R integration.

The traditional talent supply model relies on industry-academia-research collaboration and demand-oriented training, which offers precise supply but suffers from limited flexibility, inadequate comprehensive skills development, and uneven cooperation depth.

To address these drawbacks, a “curriculum + project” model with modular content, along with an industry-academia-research joint governance

mechanism, is recommended. For instance, the Huawei ICT Academy (a collaboration between Huawei and Shenzhen Polytechnic) co-develops professional courses and shares resources, thereby achieving an employment rate of over 98 % [6] and enabling 60 % of students to secure flexible cross-role employment.

Additionally, an alternating work-study model helps avoid premature career locking. Overall, this diversified system meets the dynamic needs of both industries and students, while aligning with resource dependence theory, human capital theory, and competency models.

Enterprises release demand information, and universities dynamically adjust their curricula accordingly to reduce supply-demand mismatches. Specifically, the optimized dynamic path follows: "enterprise demand release → joint selection → customized training → process evaluation → talent pool screening → formal delivery".

As a practical example, the "order-based dynamic training path" (a partnership between Geely and Zhejiang Vocational Institute of Automotive Technology) synchronizes quarterly demand updates, conducts monthly assessments, and as a result, has achieved a probation retention rate of 91 % [7] and a 15 % improvement in initial performance.

This paper systematically expounds the "industry-education-research" integrated training model by enriching the training system, engaging enterprises in the training process and optimizing evaluation criteria through competency models. Through these measures, enterprises can obtain a stable and high-quality talent supply, universities can enhance educational quality and reputation, and students can gain more employment opportunities. However, to ensure effective operation of this framework and realize value circulation, the key lies in establishing an appropriate and scientifically sound effectiveness-evaluation mechanism; the details are given below.

Firstly, evaluate the training quality of the training process, which can be fed back in the short term. The key indicators lie in the combination of courses and practice, the proportion of university and enterprise teachers, and student satisfaction, which can be judged by the passing rate of skill certification, the degree of project completion, and the graduation qualification rate.

Secondly, evaluate job fit, retention rate, and development potential, which can be fed back through the probationary retention rate after employment, initial performance, supervisor satisfaction, tenure, core position retention rate, promotion speed, salary increase, and the number of outstanding achievements obtained, and this is also the core part of the evaluation system.

Integrating the training infrastructure into the talent-supply-chain management system helps enterprises realize a strategic shift from passive response to proactive planning. It enables enterprises to "stockpile" a stable, accurate and efficient talent supply, and effectively avoids the economic risks caused by "skill – job mismatch". Optimizing the university – enterprise collaborative talent-training mechanism helps break organizational barriers and cognitive gaps and promotes deep alignment and dynamic adaptation between talent-training standards and enterprises' actual needs [1]. Constructing a long-term evaluation and feedback mechanism can drive continuous iteration and value creation of the "industry-education-research" integration system and ensure the visibility and sustainability of its strategic contribution.

For enterprises, it is imperative to establish a graduate career-development monitoring and feedback mechanism. On the one hand, this includes tracking the career-Deve system and of new employees, analyzing key factors such as skill gaps and development bottlenecks, and systematically feeding the results back to universities to support the optimization of training programs. On the other hand, in the cultivation of new employees, the frequency of interaction with university teachers can be appropriately increased. For example, enterprises can invite technical and professional managers to participate in courses teaching and graduation-project guidance or organize existing employees to return to campus for short professional-development courses. Enterprises can also jointly develop and implement comprehensive curricula, modular projects and work-integrated training incubation systems with universities.

Universities should actively carry out independent innovation, proactively align with the frontier needs of industry development, and establish a dynamic adjustment mechanism for degree programs [2].

At the same time, enterprise mentors should be introduced into the evaluation system, with project-completion quality and practical skills as key indicators. This will fundamentally enhance human-capital value and promote China's strategic transformation from a large labor-force country to a human-capital power.

Overall, through the five-party collaborative model of "government-industry-education-evaluation-application", the talent-training quality of "industry-education-research" integrated bases can be optimized [4].The government coordinates and supervises at the macro level; industry associations and leading enterprises dominate curriculum development and learning-outcome evaluation; universities, as the main implementing body, should construct

modular curricula based on production logic; the ultimate common goal is to promote the application of knowledge in industrial practice.

Only by integrating multi-party resources can a closed loop of high-quality talent delivery be formed.

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