

# Exploring the Talent Cultivation Model for Interdisciplinary Versatile Talents in Local Application-Oriented Universities under the Background of Interdisciplinary Integration

Wei Wei

School of Innovation and Entrepreneurship, Yancheng Institute of Technology, Yancheng 224051, Jiangsu, China

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**Abstract:** As an important pillar serving regional economic and social development, local application-oriented universities have the core mission of cultivating interdisciplinary versatile talents who possess multidisciplinary knowledge, comprehensive practical abilities, and innovative literacy. This paper analyzes the prominent problems currently confronting talent cultivation in application-oriented universities and, in light of the inherent requirements of interdisciplinary integration, constructs an interdisciplinary versatile talent cultivation model characterized by “conceptual guidance—three-stage implementation—multi-party collaboration,” with a view to providing a reference for the reform of talent cultivation in local application-oriented universities.

**Keywords:** Interdisciplinary integration; Application-oriented universities; Interdisciplinary versatile talents; Cultivation model

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## 1. Introduction

Against the backdrop of the in-depth implementation of the strategy of building a leading country in education, the transformation and upgrading of local industries have placed higher demands on talents' interdisciplinary vision and their ability to deal with complex problems. Local application-oriented universities take serving regional economic and social development as an important mission; however, the traditional talent cultivation model has long been confined to single-discipline institutional structures, with prominent disciplinary barriers, resulting in problems such as students' narrow knowledge structures, low adaptability to industrial positions, and insufficient innovative and practical abilities. The *Measures for the Establishment and Management of Interdisciplinary Disciplines (Trial)*, issued by the Academic Degrees Committee of the State Council, point out that interdisciplinary disciplines can create new methods and

theories and construct entirely new knowledge structures. In essence, interdisciplinary integration is the organic blending of knowledge paradigms and thinking methods from different disciplines, and it constitutes a key pathway for cultivating interdisciplinary versatile talents.

Current research on talent cultivation centered on interdisciplinarity has mostly focused on research universities, while research on model construction and practical pathways specifically for local application-oriented universities remains to be deepened <sup>[1]</sup>. Therefore, combining the realities of local application-oriented universities, this paper analyzes the practical dilemmas of interdisciplinary versatile talent cultivation and constructs a cultivation model adapted to regional industrial needs.

## **2. The current situation of interdisciplinary versatile talent cultivation in application-oriented universities under the background of interdisciplinary integration**

### **2.1. Insufficiently clear positioning of cultivation objectives**

Some universities have an inadequate grasp of the connotation of interdisciplinary-based versatile talent cultivation. They have failed to formulate stratified and categorized cultivation standards grounded in the knowledge logic of interdisciplinary disciplines, and their curriculum provision and practical training do not fully reflect the requirement for the stepwise cultivation of interdisciplinary abilities. Meanwhile, the cultivation objectives are not closely aligned with local industrial needs, and a regular mechanism of enterprise investigation and feedback is lacking, resulting in a disconnect between talent output and the actual needs of regional industries <sup>[2]</sup>.

### **2.2. Poor interdisciplinary curriculum construction**

In some universities, interdisciplinary courses are mostly offered as electives with a low proportion of credits, and an integrated curriculum layout combining “compulsory and elective” courses has not yet been formed. Some interdisciplinary courses lack an in-depth exploration of the internal logic of knowledge across different disciplines, and course content is fragmented. Problems such as duplicated course construction and insufficient sharing of teaching resources also exist, making it difficult to effectively train students’ interdisciplinary thinking abilities.

### **2.3. Shortcomings in the interdisciplinary faculty**

Most existing teachers have been trained within a single disciplinary system, with rigid disciplinary backgrounds and a lack of experience in interdisciplinary teaching and research. Many universities have not yet established systematic training mechanisms for interdisciplinary teachers, and teachers rarely participate in enterprise practice or cross-institutional academic exchanges. The current systems of professional title evaluation and performance assessment emphasize research outputs within a single discipline and insufficiently recognize interdisciplinary teaching and research achievements, which to a certain extent weakens teachers’ intrinsic motivation to participate in interdisciplinary education.

### **2.4. Insufficient effectiveness of practice-based education**

Local application-oriented universities generally face difficulties such as an insufficient number of interdisciplinary experimental and practical training platforms and delayed equipment updates, which make it difficult to support comprehensive multidisciplinary practical teaching. Industry-education integration mostly remains at the level of shallow cooperation such as visits and internships, and enterprises do not participate

deeply enough in the design of talent cultivation programs, curriculum development, and other links. The linkage among virtual simulation platforms, on-campus incubation bases, and real industrial practice scenarios is not smooth, and the synergistic educational effectiveness of the first classroom and the second classroom has not been fully realized.

## **2.5. Poor collaborative governance mechanism**

Some universities lack specialized institutions to coordinate interdisciplinary construction, and systems for cross-college course selection and mutual recognition of credits remain to be further implemented. The circulation of resources among government, universities, enterprises, and research institutions is not smooth; a stable government-industry-university-research collaborative education community has not yet been formed; and the division of rights and responsibilities among multiple actors is not sufficiently clear, making it difficult to effectively pool off-campus resources to feed back into talent cultivation.

## **3. Construction of an interdisciplinary versatile talent cultivation model based on interdisciplinary integration**

Grounded in the institutional positioning of local application-oriented universities and oriented toward serving regional economic and social development, an interdisciplinary versatile talent cultivation model of “conceptual guidance—three-stage implementation—multi-party collaboration” is constructed, connecting the entire chain of “objectives—curriculum—faculty—practice—support”<sup>[3]</sup>.

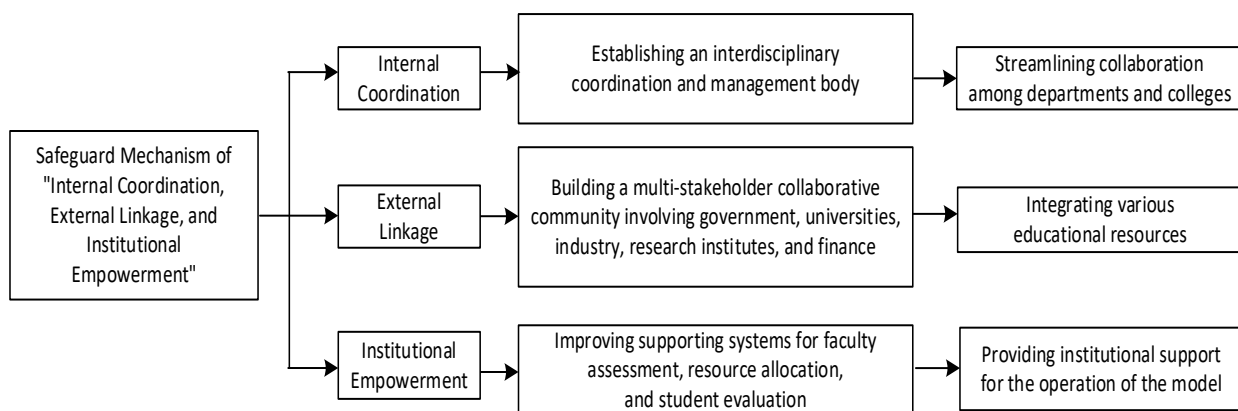
- (1) Establishing the educational philosophy of “local grounding, integration of general and specialized education, and competence orientation,” and embedding value shaping throughout the whole process of talent cultivation. It is necessary both to consolidate students’ professional foundations and to cultivate their interdisciplinary thinking, innovative and practical abilities, and sense of social responsibility, taking alignment with regional industrial needs as the starting point of talent cultivation reform and avoiding blind replication of the interdisciplinary construction models of research universities.
- (2) Constructing a three-stage implementation system of “curriculum—teams—practice,” and embedding the cultivation of interdisciplinary abilities throughout the whole process of talent cultivation. First, establishing composite curriculum modules: building an integrated curriculum system of “general education + professional core + interdisciplinary expansion,” flexibly employing diverse forms such as major-minor programs and double degrees, implementing the mutual credit recognition system, and consolidating the foundation of interdisciplinary knowledge. Second, building composite teaching teams: forming teaching teams composed of on-campus teachers from multiple disciplines together with enterprise and industry mentors, combining full-time and part-time staff to conduct course teaching and project guidance. Third, building composite practice platforms: integrating virtual simulation experiment platforms, on-campus incubation platforms, and enterprise practice platforms, and relying on scientific research projects and disciplinary competitions to achieve the organic connection of theoretical learning, simulated training, and industrial practice, with a focus on cultivating students’ ability to solve complex problems. The overall structure of this three-stage implementation system is shown in **Table 1**.

**Table 1.** The three-stage implementation system of “curriculum—teams—practice”

| Dimension                           | Implementation measure                    | Implementation content                                                                                                                                                                                                                                                     | Intended outcome                                                                    |
|-------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Curriculum (knowledge supply layer) | Establishing composite curriculum modules | Building an integrated curriculum system of “general education + professional core + interdisciplinary expansion”; flexibly employing diverse cultivation forms such as major-minor programs and double degrees; implementing the mutual credit recognition system         | Consolidating students’ interdisciplinary knowledge foundation                      |
| Teams (teaching support layer)      | Building composite teaching teams         | Forming teaching teams composed of on-campus teachers from multiple disciplines together with enterprise and industry mentors; adopting a combined full-time and part-time staffing model; jointly conducting course teaching and project guidance                         | Providing support for interdisciplinary teaching and scientific innovation guidance |
| Practice (competence output layer)  | Building composite practice platforms     | Integrating virtual simulation experiment platforms, on-campus incubation platforms, and enterprise practice platforms; relying on scientific research projects and disciplinary competitions to connect theoretical learning, simulated training, and industrial practice | Cultivating students’ comprehensive ability to solve complex problems               |

Note: Taking the cultivation of interdisciplinary competence as the main thread running through the whole process of talent cultivation, this system synergistically advances the cultivation of versatile talents from three levels: knowledge supply, teaching support, and practical training.

- (3) Improving the support mechanism of “on-campus coordination, off-campus linkage, and institutional empowerment,” and embedding collaborative governance throughout the whole process of talent cultivation. Internally, an interdisciplinary coordinating and management body is established to rationalize the collaborative relationships among departments and schools; externally, a multi-party collaborative community involving government, universities, industry, research, and finance is built to integrate various educational resources <sup>[4]</sup>; at the same time, supporting systems for teacher assessment, resource allocation, and student evaluation are improved to provide institutional support for the operation of the model. The structure of this safeguard mechanism is illustrated in **Figure 1**.



**Figure 1.** The Safeguard Mechanism of “Internal Coordination, External Linkage, and Institutional Empowerment.”

Note: Collaborative governance runs through the whole process of talent cultivation. Internal coordination streamlines internal relations, external linkage pools educational resources, and institutional empowerment strengthens mechanism support, thereby ensuring the orderly operation of the versatile talent cultivation model.

## **4. Implementation pathways for interdisciplinary versatile talent cultivation in local application-oriented universities**

### **4.1. Anchoring regional industrial needs and refining stratified and categorized cultivation objectives**

Industry experts and key technical personnel from enterprises should be invited to jointly participate in the revision of talent cultivation programs, refining knowledge, ability, and quality indicators in line with local industrial needs, and distinguishing the ability requirements of students at different stages so as to avoid the generalization of cultivation objectives. A dynamic adjustment mechanism for cultivation objectives should be established to promptly optimize cultivation programs in response to industrial transformation and upgrading, achieving precise alignment between talent supply and local industries <sup>[5]</sup>.

### **4.2. Strengthening specialty cluster construction and optimizing the interdisciplinary curriculum system**

Disciplinary and professional barriers should be removed, and interdisciplinary curriculum development teams should be organized to advance the integrated construction of specialty clusters. The proportion of credits allocated to interdisciplinary courses should be appropriately increased, changing the current situation in which such courses are mainly electives, and constructing a curriculum architecture in which compulsory and elective courses complement each other <sup>[6]</sup>. Curriculum development should avoid the simple splicing of knowledge points; instead, it should delve deeply into the internal logic of the disciplines and incorporate real industrial cases and cutting-edge research findings. Cross-major course selection and mutual credit recognition should be implemented, course resources shared, and students' channels for interdisciplinary learning broadened.

### **4.3. Combining recruitment and cultivation to build an interdisciplinary and composite faculty**

On the one hand, teachers with interdisciplinary backgrounds should be recruited, and skilled technicians from enterprises should be engaged to enrich the pool of part-time teachers; on the other hand, incentive mechanisms for the professional growth of in-service teachers should be improved, encouraging teachers to pursue interdisciplinary further study, take temporary positions in enterprises, and jointly apply for cross-field research projects. The teacher evaluation system should be reformed to incorporate interdisciplinary curriculum development and collaborative education achievements into performance assessment and professional title evaluation systems, thereby stimulating teachers' initiative in participating in interdisciplinary education.

### **4.4. Coordinating multi-party resources and building multi-level practice education platforms**

Investment in interdisciplinary laboratories and virtual simulation platforms should be increased, and university-enterprise co-construction and sharing of practical training hardware resources should be promoted. Industry-education integration should be deepened, the construction of industry colleges advanced, and enterprise production projects transformed into teaching projects, so as to improve the multi-level practical teaching system of “classroom experiments—scientific innovation training—industrial internships.” The first and second classrooms should be connected, and practical scenarios should be expanded through

disciplinary competitions, innovation and entrepreneurship training, and social practice, promoting the transformation of theoretical knowledge into practical ability.

#### **4.5. Improving collaborative governance and strengthening institutional support**

A collaborative education community should be established to clarify the rights and responsibilities of each actor, promote the aggregation of policy, industrial, and research resources toward talent cultivation, and form a pattern of co-construction, co-governance, and sharing. The methods of student academic evaluation should be reformed by reducing the weight of single written examinations and increasing the proportion of evaluation given to interdisciplinary project outcomes and practical performance, establishing an evaluation orientation that promotes the growth of interdisciplinary versatile talents.

### **5. Conclusion**

Interdisciplinary integration is an important pathway for local application-oriented universities to break through the dilemmas of talent cultivation and enhance the capacity of talents to support regional economic and social development. Application-oriented universities should ground themselves in their own institutional positioning, keep close track of local industrial needs, break down disciplinary barriers, and continuously improve collaborative education mechanisms, so as to cultivate interdisciplinary versatile talents with interdisciplinary vision who can serve high-quality local development.

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### **Disclosure statement**

The author declares no conflict of interest.

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