Research on the Reform of Application-Oriented Talent Cultivation in Higher Education

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Abstract: Against the backdrop of industrial transformation and the development of application-oriented undergraduate education, universities face challenges such as program-industry mismatch, curriculum-job disconnection, and weak practical and innovative training. Following the logic of "situation analysis—model construction—practical verification—policy recommendations," this paper explores the reform path of application-oriented talent cultivation. It proposes a "Three Alignments—Four Progressions model and establishes an evaluation model for reform effectiveness. A comparative study of 94 experimental and 94 control students shows that the reform significantly improves students' application abilities, with the comprehensive index rising from 53.0 to 87.0. Finally, practical suggestions are offered regarding program structure, curriculum system, teaching platforms, and evaluation mechanisms.

Keywords: Application-Oriented Talent Cultivation; Reform; Industry–Education Integration; Job Competence; Higher Education

1. Introduction

Industrial transformation and the development of new quality productive forces have increased the demand for application-oriented talents, while policies on applied undergraduate education and industry–education integration continue to advance. However, many universities still face problems such as mismatches between academic programs and industrial needs, curricula disconnected from job competencies, weak university–enterprise collaboration, and evaluation that overemphasizes knowledge assessment. Therefore, guided by job competencies and supported by industry–education collaboration, this paper constructs a reform model featuring three alignments (programs with industries, curricula with job positions, evaluation with standards) and four progressions (cognitive foundation, simulated training, workplace practice, innovation and entrepreneurship), aiming to improve the match between talent supply and industrial demand and to provide practical references for application-oriented talent cultivation reform in higher education.

2. Theoretical Basis and Reality Analysis

2.1 Connotation of Application-Oriented Talent Cultivation Reform

Application-oriented talents refer to high-quality individuals who possess systematic professional knowledge and can apply it to practical work scenarios to solve real problems. Reform of application-oriented talent cultivation is a systematic restructuring of cultivation objectives, program structures, curriculum systems, teaching methods, and evaluation mechanisms under the guidance of industrial demand and job competencies. Its core features include industry–education collaboration, job orientation, practical integration, and capability-based development.

Industry–education collaboration does not simply mean adding practical teaching activities. Rather, it introduces industrial elements and occupational standards into the cultivation process, thereby promoting a shift from discipline-based to capability-based education, from supply-oriented to demand-oriented training, and from campus-centered cultivation to collaborative cultivation between universities and enterprises.

2.2 Practical Difficulties in Application-Oriented Talent Cultivation in Higher Education

Based on a survey of a certain university, the difficulties in application-oriented talent

cultivation can be summarized into the four dimensions shown in Table 1. These difficulties are intertwined with one another. They cannot be fundamentally resolved merely by adding practical courses or short-term internships; instead, they require systematic reconstruction at the level of the cultivation model.

Table 1. Analysis of the Practical Difficulties in Application-Oriented Talent Cultivation in Higher Education

Dimension of Difficulty	Specific Manifestations	Limitations of the Traditional Cultivation Model
Program Structure	Mismatch between academic programs and industrial demand	Lack of a dynamic adjustment mechanism
Curriculum System	Disconnection between curricula and job competency requirements	Overly discipline-oriented, with insufficient practical training
Industry–Education Collaboration	Superficial school–enterprise cooperation	Lack of in-depth collaborative platforms
Evaluation Method	Overemphasis on knowledge assessment and insufficient attention to capability outcomes	Unable to support capability-oriented cultivation

2.3 Mechanisms of Industry–Education Collaboration Empowering Talent Cultivation

Industry–education collaboration empowers application-oriented talent cultivation through three mechanisms. First, the alignment mechanism ensures precise matching of programs with industries, curricula with job positions, and evaluation with standards, transforming supply–demand mismatch into alignment. Second, the collaborative mechanism integrates university and enterprise resources through industrial colleges, dual-qualified teaching teams, and practical training platforms, shifting superficial cooperation into deep collaboration. Third, the integration mechanism connects the capability cultivation chain through the progressive pathway of cognition, training, practice, and innovation, enabling the transition from knowledge acquisition to job competence and innovative practice. Together, these mechanisms support the cultivation goal of capability-based development and job competence.

3. Construction of the Reform Model for Application-Oriented Talent Cultivation

3.1 The "Three Alignments–Four Progressions" Reform Model for Application-Oriented Talent Cultivation

Guided by job competence and industry–education collaboration, this study constructs a "Three Alignments–Four Progressions" reform model for application-oriented talent cultivation. The model is supported by three alignments—academic programs aligned with industries, curricula aligned with job positions, and evaluation aligned with standards—and follows four progressive stages: cognitive foundation, simulated training, workplace practice, and innovation and entrepreneurship. Programs aligned with industries enable dynamic adjustment based on industrial demand; curricula aligned with job positions reconstruct the curriculum system according to competency requirements; evaluation aligned with standards reforms capability assessment based on industry standards. The four progressions sequentially strengthen professional foundations, skill development, job competence, and innovation transformation. Through university–enterprise collaboration and continuous feedback from industrial demand, the model promotes systematic improvement in cultivation quality. The overall structure is shown in Figure 1.

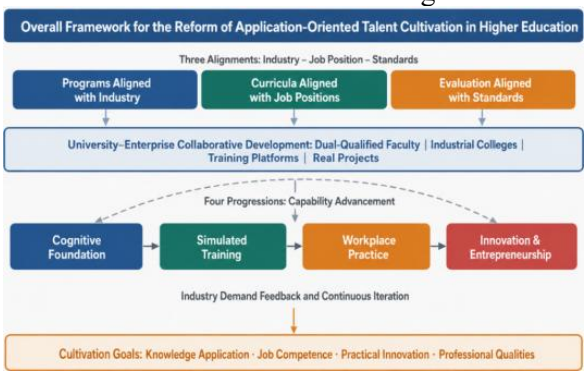

Figure 1. Overall Framework of the "Three Alignments–Four Progressions" Reform Model for Application-Oriented Talent Cultivation in Higher Education

3.2 Key Supports and Evaluation Model for Cultivation Effectiveness

To evaluate the effectiveness of the reform, this study constructed a comprehensive evaluation index for application-oriented talent cultivation. The index consists of four dimensions: professional knowledge application, job-specific practical skills, practical innovation, and professional qualities. The weighted model is

expressed as follows:

$A = w_1K + w_2S + w_3P + w_4V$

where K, S, P, and V represent professional knowledge application, job-specific practical skills, practical innovation, and professional qualities, respectively. Based on expert consultation and the Analytic Hierarchy Process, the weights were set as 0.25, 0.30, 0.25, and 0.20. The value-added effect of cultivation was measured by the difference between the post-test and pre-test scores, namely $\Delta A = A\_post - A\_pre$.

4. Teaching Practice and Effectiveness Analysis

4.1 Practice Design and Sample

A comparative practice was conducted among application-oriented undergraduate programs at a university. From the same major and cohort with comparable entrance levels, 94 students were assigned to the experimental group (using the "Three Alignments–Four Progressions" reform model) and 94 to the control group (using the traditional discipline-based model). The two groups were balanced in teaching staff, credits, and objectives, differing only in the cultivation model. Data were collected through pre- and post-tests of capabilities, project outcomes, internship evaluations, and teacher–student interviews.

4.2 Analysis of Cultivation Effectiveness

After the completion of the cultivation process, the comparison of application ability dimensions between the two groups is shown . The experimental group performed significantly better than the control group in five dimensions: professional knowledge application, job-specific practical skills, practical innovation ability, professional qualities, and complex problem-solving. Its overall capability structure expanded outward and became more balanced, indicating that the reform of application-oriented talent cultivation effectively promoted the systematic development of core application abilities.

The experimental group outperformed the control group across all major dimensions of application ability, indicating that the reform model effectively improved students' core applied competencies.

The comparison of key comprehensive indicators is shown in Table 2. The experimental group performed significantly better than the control group in terms of comprehensive cultivation effectiveness, job-specific practical skills, practical innovation, and the attainment rate of job competence. The differences were statistically significant, as verified by an independent-samples t-test ($p < 0.01$), confirming the effectiveness of the cultivation model constructed in this study.

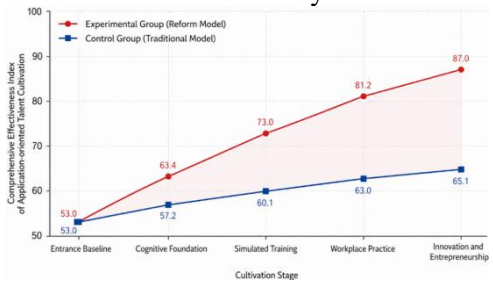

Figure 2. Evolution Curve of the Comprehensive Effectiveness Index of Application-Oriented Talent Cultivation Across Cultivation Stages

Table 2. Comparison of Key Indicators Between the Experimental Group and the Control Group

Evaluation Indicator	Control Group	Experimental Group	Improvement
Comprehensive Index of Application Ability	65.1	87.0	+21.9
Comprehensive Cultivation Effectiveness A	63.8	85.6	+21.8
Job-Specific Practical Skills Score	64.0	88.0	+24.0
Attainment Rate of Job Competence / %	57.4	89.4	+32.0
Proportion of High-Quality Outcomes / %	9.6	27.7	+18.1

4.3 Teacher–Student Feedback and Qualitative Analysis

Interviews and questionnaire feedback show that students generally believed the courses were "closely related to job positions and practically useful," and that workplace practice training "significantly enhanced their employment confidence and job competence." Teachers reported that university–enterprise collaboration and dual-qualified teaching teams "enriched teaching resources and improved the practical orientation of courses." The involvement of industry mentors effectively enhanced students' practical innovation abilities. At the same time, the feedback also revealed problems such as insufficient stability in university–enterprise collaboration and a relatively low proportion of dual-qualified teachers, suggesting that corresponding support mechanisms are needed

when the model is promoted more widely.

5. Countermeasures and Suggestions

Based on the empirical results, universities should promote application-oriented talent cultivation reform from four aspects: establishing a dynamic program adjustment mechanism according to regional industrial demand; reconstructing curriculum systems around job competency maps and practical learning modules; strengthening university–enterprise platforms, industrial colleges, and dual-qualified teaching teams to support real-project-based teaching; and developing a capability-oriented evaluation system that incorporates workplace practice, project outcomes, professional qualities, industry standards, and enterprise assessment. These measures should be implemented through pilot testing, iterative optimization, and phased promotion.

6. Conclusion and Prospects

This study constructed and verified a "Three Alignments–Four Progressions" reform model for application-oriented talent cultivation in higher education. The results show that industry–education collaboration can effectively address the problems of supply–demand mismatch, superficial cooperation, and insufficient capability development. The comparative practice further demonstrates that the reform model significantly improves students' comprehensive application ability, job-specific practical skills, practical innovation, and job competence. Future research may expand the sample size, include more universities and disciplines, and conduct long-term tracking of graduates' career development to further verify the generalizability and sustainability of the model.

Acknowledgements

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