Research on the Cultivation Model for Young Teachers in Application-oriented Undergraduate Universities

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Abstract: Young teachers are the primary driving force for the sustainable development of universities. Addressing the structural dilemmas currently prevalent in the cultivation of young teachers in application-oriented undergraduate universities, a novel cultivation model "1B2C3A4L" based on systems theory and teacher professional development stage theory is proposed in this paper. This model takes teacher ethics and professional conduct as the one body (1B) that anchors the value orientation, empowers teachers through the professional competence and educating competence (2C), drives holistic development through the integration of teaching ability, research-to-teaching feedback ability, and practical application ability (3A) and charts a stepwise advancement path through four level ladder-based growth (4L) which contains Entry→Qualified→Advanced→Distinctive.
The proposed model constructs a systematic cultivation ecosystem with professional ethics at its core, competence as its enabler, and progressive advancement as its trajectory, providing a replicable and scalable reference paradigm for the construction of a high-caliber, professionalized teaching force in the new era.

Keywords: Young Teachers; 1B2C3A4L; Teacher Cultivation Model; Application-oriented Undergraduate Universities

1. Introduction

Teachers are the foundation of education and the source of its vitality. In recent years, national policies have increasingly emphasized the strategic importance of teacher force development, particularly in higher education institutions. The year 2024 witnessed the issuance of major guidelines [1] that explicitly called for strengthening the teaching force as a fundamental task in building a strong education system. These guidelines urged universities not only to focus on knowledge-transmission skills but also to reshape teachers' professional value identification and sense of educational mission. Under this strategic orientation, how to construct a scientific and systematic young teacher cultivation system has become a core issue urgently requiring resolution for the high-quality development of higher education, and also a strategic priority for university teaching force construction in the context of the "Double First-Class" initiative [2].

For the application-oriented undergraduate university, the cultivation of young teachers faces even more distinctive challenges. These institutions bear the dual mission of cultivating high-caliber application-oriented talents and serving regional economic and social development. In 2015, the national guidelines on steering local undergraduate universities toward application-oriented transformation established the developmental direction of serving local industrial needs. Subsequent policies on deepening industry-education integration further emphasized that industry-education integration is a critical pathway to address the disconnect between university talent cultivation and societal demands, calling for the establishment of long-term mechanisms for deep industry-education integration. In this context, young teachers in application-oriented universities are expected to possess both academic depth and practical competence, a compound set of requirements that integrates scholarly rigor with hands-on capability.

However, focusing on the current professional development landscape of young teachers in application-oriented undergraduate universities, four dimensions of structural contradiction are particularly pronounced: 1. the disconnect between ethical commitment and professional competence; 2. the schism between teaching

and research; 3. the separation of theory and practice; and 4. ambiguous career progression pathways.

From an international perspective, a few renowned universities such as Harvard University and the University of Michigan have established systematic, consultative support systems through well-developed teaching and learning centers, offering mentoring, workshops, and formative feedback mechanisms [3]. Some domestic research-intensive universities are actively exploring similar models, yet they still suffer from issues such as insufficient coverage, convergent models, weak integration with disciplines, and underdeveloped evaluation systems. Moreover, the acceleration of educational digital transformation also imposes higher demands on teachers' digital literacy [4,5], necessitating the construction of corresponding capacity support frameworks. Against this backdrop, breaking free from the traditional cultivation and constructing a new ecosystem for young teacher growth that deeply integrates value guidance, competence building, and pathway support holds significant theoretical value and practical relevance.

This paper aims to address the challenges by the novel "1B2C3A4L" cultivation model, which is systematically designed to integrate ethical grounding, competency development, and progressive advancement, tailored specifically to the institutional characteristics of application-oriented undergraduate universities.

2. Problem Description

The major challenges of the professional development for young teachers in application-oriented undergraduate universities are multifaceted and deeply rooted in institutional, cultural, and systemic factors. A detailed analysis reveals the following critical issues.

First, there is a evaluation gap between the fulfillment of teacher ethics and professional capability. Although the standards for teachers' digital literacy have explicitly set forth the dual imperatives of "ethics first, technology-enabled empowerment", some young teachers still treat professional ethics as a ritualistic commitment rather than embedding it into their daily pedagogical actions in practice [6]; meanwhile, their professional development disproportionately emphasizes measurable outputs such as publications and competition prizes, while undervaluing the substantive educational outcomes of fostering virtue through teaching.

Second, a systematic fragmentation of the research-teaching-industry ecosystem exists. Under the pressure of the prevailing academic evaluation system, young teachers tend to regard teaching as a sideline. The awareness of transforming research outcomes into teaching resources is weak, and the three major competencies of teaching implementation, research innovation, and industry practice lack an integrated support platform [7]. Teachers in application-oriented undergraduate universities still exhibit a basic disciplinary research and single-discipline professional development, resulting in insufficient practical teaching ability in cultivating high-quality application-oriented talents and weak capacity in addressing industrial needs [8]. The development of young teachers primarily remains confined to internal circulation within universities and research institutes, resulting in insufficient exposure to authentic industry education integration platforms and real-world enterprise projects. Cultivation support manifests in a fragmented manner, making it difficult to achieve research-informed teaching and industry education integration [9].

Third, there is a structural imbalance between theoretical and practical competence. The majority of young teachers in application-oriented undergraduate universities have been cultivated under the "school-to-school" talent development model, resulting in markedly insufficient engineering practice ability and industry experience. Young teacher cultivation objectives lack systematic top-level design [10], career development competence cultivation lacks continuity, and cultivation approaches struggle to meet differentiated needs. The disconnection between professional knowledge and practical experience, the rigidity of teaching methods and approaches, and the insufficiency of industry-academia-research integration are particularly salient issues.

Fourth, there is cognitive confusion regarding career progression pathways. Existing cultivation programs are largely confined to pre-service training or sporadic lectures, lacking progressive and personalized support that covers the early career stage. Most young teachers lack a clear understanding of their career advancement trajectory and an accurate assessment of their strengths and weaknesses, facing insufficient developmental motivation

and a sense of directionlessness. Without corresponding support, young teachers often feel overwhelmed by competing demands and unsure about which competencies to prioritize at different career phases. This ambiguity not only hampers their professional growth but also reduces their engagement with institutional reform initiatives.

These four problems are interdependent, the disconnect between ethics and competence exacerbates the theory-practice gap, while fragmented support systems and unclear pathways further undermine the integration of teaching, research, and industry. Therefore, a holistic and systemic model is urgently needed to address these interconnected challenges.

3. Research and Implementation

The main idea is based on teacher professional development stage theory and the integrated "teaching-learning-research-industry" paradigm, and taking into account the institutional positioning and talent cultivation characteristics of universities. In this paper, a novel young teacher cultivation model named "1B2C3A4L" is constructed as shown in Figure 1.

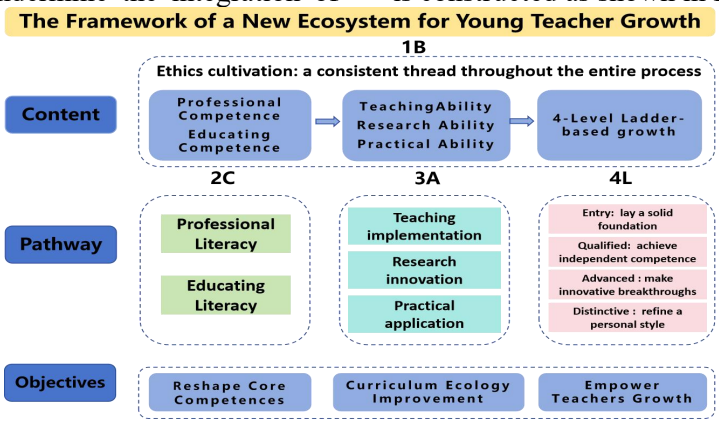

Figure 1. The Framework of Young Teacher Growth in Application-oriented Undergraduate Universities

The core logic of this model is the "1B" sets the direction, the "2C" expand the connotation, the "3A" strengthen the internal core, and the "4L" clarify the pathway, forming a closed loop from value internalization to competence externalization, and from passive discipline to active construction. This model also responds to the urgent need of application-oriented undergraduate universities for cultivating young teachers' industry education integration capabilities, which has evolved from a development option into a survival imperative.

3.1 The "1B" as Foundation: The Embodied Turn of Teacher Ethics Internalization

We regard teacher ethics and professional conduct as the primary standard that runs through the entire cultivation process. This study advocates shifting the cultivation of teacher ethics from knowledge memorization to situational action, namely through a one-course, two-plans mechanism, i.e., teaching plan and educating plan, guiding teachers to naturally integrate scientific and technological ethics, patriotic sentiments, and other ethical and value-oriented content into their professional courses, concretizing grand ethical norms into actionable classroom practices, and thereby realizing the embodied transformation from ethical cognition to educating behavior.

For example, young teachers are required to design specific ethical discussion modules within their course syllabi, such as case studies on data privacy, environmental sustainability, or engineering safety, and to document their pedagogical approaches in a reflective journal. Mentors observe and provide feedback on how these ethical elements are woven into lectures, assignments, and student interactions. This process ensures that ethics is not an add-on but an integral part of daily teaching.

3.2 The "2C" Synergy: The Reconstruction of Professionalism and Education

A symbiotic system integrating professional competence and educating competence on dual tracks is constructed. Specific implementation encompasses three levels:

First, cognitive integration, addressing teachers' confusion about "how to integrate," such as constructing disciplinary knowledge

maps and developing teaching designs that map disciplinary content onto national strategies and regional industrial needs. Workshops and collaborative lesson-planning sessions are organized to help teachers identify natural connections between their subject matter and broader educational goals.

Second, behavioral transformation, translating abstract educating requirements into concrete classroom interactions and evaluation criteria. Young teachers are trained to use specific teaching techniques, such as problem-based learning (PBL), service-learning projects, and reflective writing assignments, all of those could develop students' professional skills and their ethical reasoning simultaneously.

Third, evaluation guidance, employing quantitative tools to incorporate dual-track synergy into teaching assessment. A specific competency matrix is developed that includes indicators for both professional knowledge transmission and educative effectiveness, ensuring that teachers progress from "being able to teach" to "being adept at educating". Regular peer observations and student feedback are integrated into this evaluation system.

3.3 The "3A" Integration: The Ecological Unification of Core Abilities

This model breaks down the traditional barriers between teaching, research, and technology, systematically integrating three core abilities. With particular attention to the institutional characteristics of application-oriented under-graduate universities, practical application ability is established as a third major competency axis alongside teaching ability and research-to-teaching feedback ability, forming a more distinctively application-oriented "3A" structure.

Teaching ability focuses on the application of learning sciences, techniques for integrating ethics-embedded curriculum, and teaching evaluation and reflection, consolidating foundational skills through micro-teaching practice and a dual-mentor system.

Research-to-teaching feedback ability sets a transformation chain of "research question→inquiry project→teaching case," establishing special funds to support young teachers in transforming cutting-edge research outcomes into teaching resources. They are encouraged to conduct application-oriented research centered on regional industrial needs and to convert real industrial problems into teaching cases.

Practical application ability represents the key competency dimension that distinguishes application-oriented undergraduate universities from research-oriented institutions. Young teachers are encouraged to actively engage in cutting-edge teaching reforms such as on-the-job internships and industry-education integra-tion courses, honing their educating capabilities in authentic industrial contexts. Through various forms including secondment, on-the-job internships, and short-to-medium-term professional training, teachers are enabled to access advanced production equipment, technological processes, and corporate cultures. Support is provided for teachers to obtain industry professional certifications and advance through vocational competency assessment levels. Teachers are also encouraged to actively participate, within platforms such as industrial colleges, specialized industry classes, and university-enterprise joint laboratories, in collaborative talent cultivation program development, curriculum standard formulation, course delivery, university-enterprise textbook development, practice supervision, and innovation-entrepreneurship guidance.

3.4 The "4L" Advancement: A Dynamic Ecosystem for Stepwise Growth

Based on the laws of teacher development, an advancement pathway of "Entry→Qualified→Advanced→Distinctive" is constructed. This pathway not only defines competence standards for each stage, but also provides differentiated resource packages and evaluation priorities, offering each teacher a clear developmental map. Table 1 summarizes the stage-specific focus areas and support.

Table 1. Stage-wise Competence Standards and Support Measures for the "4L" Pathway

Stage	Core Focus	Key Support Measures	Evaluation Priorities
Entry 1–2 years	Classroom survival, ethical grounding, industry awareness	Micro-teaching practice, ethical case workshops, enterprise visits, industry expert lectures	Basic teaching competence, ethical compliance, understanding of industrial

			context
Qualified 2–3 years	Teaching independence, research-teaching linkage, initial industry engagement	Blended teaching design, research-to-teaching transformation workshops, short-term enterprise job-shadowing	Course design quality, student learning outcomes, initial industry project involvement
Advanced 3–5 years	Pedagogical innovation, research excellence, deep industry collaboration	Teaching competition, advanced AI applications, university-enterprise joint research projects	Teaching awards, research publications with educational impact, industry partnership outcomes
Distinctive 5+ years	Characteristic formation, leadership in teaching-research-industry integration	Master studio mentoring, outcome incubation, cross-institutional collaboration	Recognizable teaching philosophy, significant research-to-teaching contributions, industry-education

The process is divided into two steps. The core of first step lies in establishing standards and differentiated pilot implementation. Based on the precise profiling results, the initial 30 pilot teachers are categorized into Group A, Group B, and Group C. Group A is who in the entry stage of "4L", focusing on standardization reinforcement. Group B is who in the qualified stage, focusing on teaching independence, and Group C is in the advanced stage, focusing on innovative breakthroughs. Differentiated "3A" module training is launched for each tier: the entry stage focuses on micro-teaching practice, ethical bottom-line safeguarding, and industry awareness induction including enterprise visits and industry expert lectures; the qualified stage focuses on blended teaching design, research-teaching transformation workshops, and short-term enterprise job-shadowing; the advanced stage focuses on teaching competition preparation, in-depth AI applications, and university-enterprise joint research projects. A close monitoring mechanism of weekly class observation, monthly diagnosis, quarterly assessment is adopted at this step to ensure solid implementation of foundational standards.

The phase two is to deepen and scale up. Based on the first-year evaluation results, the pilot scale is expanded to 60–80 participants, with a dynamic upgrading/downgrading mechanism established. Group A teachers who meet the standards in the first year may be promoted to Group B, and outstanding Group B teachers are recommended for Group C cultivation. The core leverages at this step are to promote teaching through competition and outcome incubation. Seed teachers are selected and prepared for the teaching competitions, with professional competition coaching teams conducting multiple rounds of simulation and refinement, teachers demonstrating distinctive potential are selected for one-by-one characteristic refinement through university-level master teacher studios. The platform-based competency tracking system is fully operational, automatically generating "Annual Teacher Growth Reports" that serve as teaching performance references for professional title promotion and appointment, thereby achieving full-chain integration of cultivation, evaluation, and incentive.

4. Operation Mechanisms

To ensure the robust operation of the model, four core mechanisms need to be established:

In-depth Mentor System Mechanism: Clarifies the quantitative responsibility checklist for teaching mentors, research mentors, and enterprise mentors in terms of class observation, collaborative lesson preparation, diagnosis, research translation guidance, and industry practice connection, with annual performance evaluation and dynamic appointment.

Long-term Enterprise Practice Mechanism: Establishes a "tiered bases+layered content" practice system, matching to the competency stages of different teachers. Clear policy requirements are established: newly recruited teachers should engage in on-the-job learning at enterprises or public institutions for more than half a year, and core course teachers should undertake secondment or on-the-job training at enterprise frontline for more than half a year every five years.

Digital Empowerment Support: Builds an online platform integrating "need assessment, course selection, process documentation, achievement display, interactive community" to realize full-life cycle management of cultivation data.

Quality Evaluation System: Establishes a multi-stakeholder collaborative evaluation mechanism involving "teacher self-assessment, mentor evaluation, peer review, student evaluation." The duration and effectiveness of young teachers' enterprise employment or part-time

engagement and their outcomes in guiding student research, inventions, and competition achievements are taken as important indicators in performance evaluation. Annual quality reports are issued each year to ensure continuous iteration of the project on an evidence-based footing.

5. Conclusion

The proposal of the "1B2C3A4L" model represents a systematic response to the cultivation dilemmas of young teachers in application-oriented undergraduate universities in the new era. Its theoretical value lies in transforming the "internalization of teacher ethics" from an abstract concept into a logic of embodied practice, and, through the ladder-based growth advancement, reconfiguring the stage-matching theory of teacher professional development, remedying the deficiencies of traditional models that are "one-size-fits-all" and "skill-heavy but ecology-light". Its practical value lies in constructing a closed-loop ecosystem of "precise needs profiling→differentiated tiered provision→data-driven evaluation", redirecting young teachers' growth from chaotic and directionless toward clear and well-defined pathways.

In the future, further efforts will focus on designing discipline-differentiated adaptation schemes and exploring the use of educational big data mining techniques to establish more precise predictive models of teacher growth. Simultaneously, the identification and incentive mechanisms for industry-education-integrated faculty should be continuously deepened, promoting the transformation of application-oriented university teaching force development from an experience-driven to a data-driven paradigm, thereby providing stronger support for advancing the reform of university teaching force development and the high-quality development of higher education.

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