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Dilemmas and Optimization Strategies for the Professional Development of Higher Vocational College Teachers in Inner Mongolia from the Perspective of Educational Ecology

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ABSTRACT

The professional development of higher vocational college teachers is shaped not only by individual competence but also by the relationships among colleges, industry partners, policy systems, digital resources, and regional conditions. In Inner Mongolia, a useful analytical approach must account for both the common pressures of vocational education and the region's diverse economic and geographic settings. Aim: This paper examines key dilemmas affecting teacher professional development and proposes an ecology-oriented framework for improvement. Methodology: It adopts a conceptual, literature-based analysis of the four Chinese studies supplied for this paper, supplemented by a contextual review of publicly available material on vocational education and teacher development in the region. It does not claim to report original survey or interview data. Findings: The analysis identifies five connected challenges: an insufficiently differentiated professional role, uneven access to authentic workplace learning, fragmented institutional support, a gap between digital tools and pedagogical application, and evaluation mechanisms that may privilege visible outputs over sustained growth. These challenges are interpreted through the ecological concepts of niche, interaction, limiting factors, and the "flowerpot effect." Conclusion: Sustainable improvement requires coordinated action at teacher, college, industry, and regional-policy levels. The paper recommends differentiated development pathways, long-term school–enterprise learning communities, practice-oriented digital development, more supportive evaluation, and regionally responsive resource sharing. These proposals should be tested through empirical research in representative institutions across Inner Mongolia.

KEY WORDS: educational ecology, higher vocational education, Inner Mongolia, professional development, school–enterprise collaboration.

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Introduction

Higher vocational education depends on teachers who can connect disciplinary knowledge, occupational practice, and student learning. Their professional development therefore cannot be reduced to attending training sessions or accumulating certificates. It involves an ongoing process in which teachers interpret changing occupational requirements, develop teaching expertise, participate in institutional communities, and respond to regional development needs. From an educational ecology perspective, these activities take place within a system of mutually influencing people, organizations, resources, rules, and environments.

Recent Chinese scholarship has applied ecological concepts to vocational teachers' professional growth and digital literacy. Li and Peng (2025), for example, describe the effects of an unclear professional niche, a constrained "flowerpot" environment, and limiting factors on the digital literacy development of higher vocational teachers. An Tian-shu (2025) similarly places teacher digital literacy within the wider educational ecology. Li et al. (2024) discuss professional development dilemmas and possible routes for change, while Zhang et al. (2026) demonstrate the relevance of ecological thinking to values-oriented curriculum development. Taken together, these studies suggest that teacher development is best understood as a relationship between individual agency and the conditions that enable or restrict it.

The Inner Mongolia context makes this perspective particularly relevant. Higher vocational institutions operate across different local labor markets, industrial structures, settlement patterns, and resource conditions. A uniform development model may therefore fail to respond to differences between professional fields, institutions, and teachers' career stages. The aim of this paper is to identify the main ecological dilemmas that may affect higher vocational teachers' professional development in Inner Mongolia and to formulate feasible optimization strategies. The paper is conceptual rather than an empirical evaluation: its claims are analytical propositions to guide local investigation, not findings from a representative regional survey.

1. Methodology and Materials

This paper uses a qualitative, literature-based conceptual approach. The primary materials are four references provided for the study: An (2025), Li and Peng (2025), Li et al. (2024), and Zhang et al. (2026). They address teacher digital literacy, professional development, and ecology-informed curriculum practice in higher vocational education. The materials were read thematically to identify recurring concepts and to connect those concepts to the question of teacher development in Inner Mongolia.

The analysis proceeds in three steps. First, it extracts ecological concepts relevant to professional growth, including ecological niche, environmental interaction, limiting factors, and the flowerpot effect. Second, it organizes potential dilemmas into individual, institutional, school–enterprise, digital, and policy dimensions. Third, it develops recommendations that connect each dilemma with actions by teachers, colleges, industry partners, and regional education authorities. Publicly available regional information is used only to frame the context, not to infer unverified outcomes at particular institutions.

A limitation should be made explicit. The four supplied studies do not provide a representative dataset on all higher vocational teachers in Inner Mongolia. Accordingly, the challenges discussed below should be treated as analytical propositions grounded in the literature, to be checked through interviews, questionnaires, institutional documents, and comparative case studies. No numerical estimates or causal effects are claimed.

2. An Educational-Ecology Framework for Teacher Development

2.1 Teacher professional development as a dynamic ecosystem

Educational ecology directs attention from isolated individuals to relationships within a learning environment. A teacher's growth is affected by prior expertise, professional identity, workload, leadership, peer networks, access to workplace practice, digital infrastructure, and policy incentives. These factors interact: a teacher may possess strong motivation yet have few opportunities to participate in industry projects, while a college may invest in digital platforms without providing time or mentoring for meaningful classroom integration.

For analytical purposes, this paper distinguishes four connected levels. The micro level includes teachers' motivation, knowledge, identity, and reflective practice. The meso level includes departments, teaching teams, college leadership, and professional learning communities. The external level includes enterprises, industry associations, communities, and professional bodies. The policy and regional level includes qualification standards, funding arrangements, digital-resource distribution, and regional development priorities. Professional development is more likely to be sustained when these levels reinforce rather than contradict one another.

2.2 Ecological niche, limiting factors, and the flowerpot effect

An ecological niche refers here to the distinctive contribution and development space of a teacher or professional group. Higher vocational teachers need opportunities to combine pedagogical competence with occupational knowledge, but the balance differs across fields. A teacher in a technology-intensive program may need regular contact with current production processes, while a teacher in a service-oriented program may require authentic client-facing practice. If the professional role is defined too generally, development activities may become detached from occupational realities.

Limiting factors are conditions that prevent progress even when other resources are available. These may include insufficient time, weak mentoring, limited access to current equipment, unclear promotion criteria, or a lack of recognition for collaborative work. The flowerpot effect describes development that appears successful in a protected institutional setting but does not transfer well to changing workplace or community contexts. Short training courses without follow-up practice can produce this problem: teachers may learn a technique but lack opportunities to apply, adapt, and evaluate it.

These concepts are not labels for individual failure. They draw attention to how organizational design and external relationships can constrain teacher learning. The practical question is therefore not only how to improve teachers' competence, but also how to redesign the environment in which competence is developed and used.

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3. Major Dilemmas in the Inner Mongolia Context

3.1 A professional niche that is insufficiently differentiated

A general training model can overlook differences among vocational fields, institutional missions, and teachers' career stages. Teachers may be expected to teach well, maintain occupational currency, conduct applied research, support student employment, and participate in school–enterprise cooperation, while the relative priority of these responsibilities remains unclear. When expectations are not translated into distinct development routes, teachers can struggle to identify which competencies to prioritize and how progress will be recognized.

For Inner Mongolia, a region with varied local economies and occupational demands, development pathways should be sensitive to discipline and locality rather than assuming that every college faces identical conditions. This is a reasoned implication of the ecological framework, not a claim that all institutions in the region share the same problem.

3.2 Limited continuity between college learning and workplace practice

Vocational teachers need opportunities to observe and participate in current occupational practice. However, collaboration with enterprises can remain episodic if it is organized mainly around short visits, ceremonial agreements, or one-off training activities. Workplace learning has limited effect when teachers do not receive defined tasks, mentoring, time to reflect, or opportunities to translate new knowledge into curriculum and assessment.

The ecological issue is the quality of interaction between the college and its external environment. A productive partnership should be reciprocal: teachers learn from workplace practice, while enterprises contribute authentic tasks and technical feedback to curriculum improvement. Clear arrangements are also needed for scheduling, confidentiality, intellectual property, and recognition of participating staff.

3.3 Institutional conditions that restrict sustained growth

Teacher development requires time, resources, leadership support, and a culture in which experimentation and reflection are valued. If professional learning is added to already heavy workloads without workload adjustment, participation may become formal rather than substantive. If departments work in isolation, teachers may have few opportunities to share teaching materials, discuss failed approaches, or learn across specialties. If promotion and appraisal focus narrowly on easily counted outputs, collaborative mentoring and incremental classroom improvement may receive insufficient recognition.

These conditions function as potential limiting factors. They cannot be resolved through motivation campaigns alone. Colleges need to align workload, resources, leadership practices, and evaluation so that professional learning is part of normal work rather than an additional burden.

3.4 Digital development without sufficient pedagogical integration

Digital literacy is an important dimension of contemporary teacher development, but it should not be equated with the ability to operate software or platforms. Li and Peng (2025) argue that ecological niche ambiguity, the flowerpot effect, and limiting factors can obstruct digital literacy development. Applied to professional development, this means that teachers need opportunities to use digital tools for authentic vocational tasks, learning assessment, feedback, collaboration, and reflective improvement.

A technology-first approach may produce activity without meaningful change. Teachers may attend platform training yet lack subject-specific resources, reliable technical support, or time to redesign lessons. Digital development should therefore be linked to teaching problems and occupational contexts. Where infrastructure and connectivity vary, regional resource-sharing and flexible access arrangements can help reduce unequal opportunities.

3.5 Evaluation and policy support that do not fully reflect ecological growth

Professional development is a long-term process, but evaluation systems can favor short-term evidence such as attendance, certificates, or the number of outputs. These indicators may provide useful administrative information, yet they cannot by themselves show whether teaching has improved, workplace knowledge has been updated, or students have benefited. A more ecological approach should consider process, context, collaboration, and the transfer of learning into practice.

Policy support also needs to be connected to institutional implementation. Broad requirements are unlikely to create sustainable change unless colleges have the resources and discretion to translate them into field-specific plans. Regional coordination can help share high-quality resources and expertise, while avoiding a one-size-fits-all model.

4. Optimization Strategies

4.1 Establish differentiated development pathways

Colleges should define development routes that reflect professional field, career stage, and role. A possible framework includes an entry stage focused on teaching foundations and occupational orientation; a consolidation stage focused on curriculum design, assessment, and workplace practice; and an advanced stage focused on mentoring, applied research, innovation, and program leadership. These stages should be flexible rather than rigid, allowing teachers to move according to evidence of competence and changing responsibilities.

Each pathway should specify learning goals, practical tasks, support arrangements, and evidence of progress. Professional portfolios may include revised teaching materials, workplace-learning reflections, student work analysis, peer observations, and documented improvements to assessment. The purpose is to make development visible without reducing it to a checklist.

4.2 Build long-term school–enterprise learning communities

Colleges should move from occasional cooperation to sustained professional learning partnerships. Each partnership can identify shared occupational competencies, establish annual workplace-learning plans, assign mentors from both college and enterprise, and agree on a practical output such as a revised module, a case bank, a simulated task, or an updated assessment rubric. Teachers should have protected time to participate and a structured opportunity to share learning with colleagues after returning to campus.

Partnership quality should be evaluated by the continuity and usefulness of learning, not only by the number of signed agreements.

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Enterprise mentors should also receive recognition for their contribution. Where a single enterprise cannot provide adequate exposure, colleges may coordinate several partners or use sector associations to broaden teachers' experience.

4.3 Remove institutional limiting factors

College leadership should conduct periodic reviews of barriers to professional learning. Reviews can examine workload, access to equipment, availability of mentors, funding procedures, digital support, and the fairness of appraisal. Results should lead to specific changes—for example, protected development hours, small grants for teaching experiments, cross-department lesson-study groups, and technical support for classroom implementation.

Professional learning communities can make development continuous. Teachers working in related fields can jointly plan a lesson, observe its implementation, examine student responses, and revise the design. The emphasis should be on evidence and shared problem-solving rather than on identifying individual shortcomings. Leadership should create a climate in which well-documented experimentation is valued, including when an approach does not work as expected.

4.4 Connect digital literacy to vocational teaching practice

Digital professional development should start from authentic teaching and occupational tasks. Instead of offering only general platform instruction, colleges can organize workshops in which teachers build digital learning resources, develop simulations, analyze assessment evidence, or design feedback activities for a specific course. Training should include guided practice, peer review, classroom application, and follow-up coaching.

A regional resource-sharing mechanism could support institutions with fewer specialist resources. Shared repositories should include adaptable lesson plans, simulation scenarios, assessment tools, and examples of responsible technology use. Resources should be reviewed for relevance, accessibility, and alignment with occupational standards. Digital development should also address data protection, academic integrity, accessibility, and the responsible use of artificial intelligence.

4.5 Reform evaluation to recognize sustained and collaborative growth

A balanced evaluation system should combine evidence of professional learning, classroom practice, workplace engagement, collaboration, and contribution to student learning. No single indicator should determine the assessment. Possible evidence includes peer-reviewed teaching portfolios, records of industry-based learning, revised curriculum materials, reflective reports, mentoring contributions, and student feedback interpreted in context.

Evaluation should serve both accountability and development. Teachers need clear expectations and fair recognition, but they also need feedback that helps them identify the next step in their growth. Colleges can use annual development conversations to agree on goals, resources, and review points. At regional level, authorities can encourage comparable principles while allowing institutions to adapt indicators to their missions and professional fields.

4.6 Create regionally responsive support and resource sharing

Regional support should respond to differences in institutional capacity and professional demand. Shared training opportunities, cross-college teaching communities, online resource libraries, and rotating expert workshops can help extend access to expertise. Where travel or distance creates barriers, blended arrangements may make participation more practical, provided online activity is supplemented by authentic practice and feedback.

Regional authorities and colleges should also collect evidence before scaling a program. Pilot initiatives can be tested across institutions that differ in location, size, and professional focus. The purpose of pilots is to discover which supports work for which groups and under what conditions, not simply to demonstrate compliance with a predetermined model.

5. Discussion

The proposed strategies follow a central implication of educational ecology: teacher professional development depends on alignment among personal agency, institutional conditions, external partnerships, and policy support. Training alone cannot compensate for weak workplace links; digital infrastructure alone cannot ensure pedagogical change; and evaluation alone cannot create a supportive learning culture. Improvement requires the removal of constraints and the strengthening of relationships through which teachers can use new knowledge.

The framework also cautions against treating Inner Mongolia as a homogeneous setting. Institutions may differ in resources, program mix, employer networks, and local needs. Therefore, the recommendations should be adapted through local diagnosis. A regional framework can establish shared principles—continuous learning, authentic practice, collaboration, and fair evaluation—while permitting different implementation routes.

Future research should examine these propositions empirically. A multi-site study could sample teachers from different professional fields and institution types, combining questionnaires with interviews, document analysis, and case studies of school–enterprise partnerships. Longitudinal research could investigate whether protected workplace learning, mentoring, and revised evaluation are associated with changes in teaching practice. Such work should report sampling, instruments, analytical procedures, and limitations transparently. Until this evidence is available, the strategies in this paper should be understood as a reasoned framework for local testing rather than proven causal interventions.

6. Conclusion

From the perspective of educational ecology, the professional development of higher vocational college teachers in Inner Mongolia should be understood as a system-level process rather than an individual training task. The literature-based analysis highlights five potential dilemmas: insufficiently differentiated professional roles, discontinuous workplace learning, institutional constraints, weak integration of digital tools with pedagogy, and evaluation that may overlook sustained growth. These challenges are connected and may reinforce one another.

The paper proposes six directions for optimization: differentiated development pathways; long-term school–enterprise learning communities; removal of institutional limiting factors; practice-oriented digital development; evaluation that recognizes collaborative and sustained growth; and regionally responsive resource sharing. Their value lies in linking teacher learning to the environment in which it must be applied. Because this paper does not present original regional field data, the proposals require validation through research across representative colleges in Inner

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Mongolia. A more supportive and connected educational ecology can provide a practical basis for that work.

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