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Research and Practical Study on the Development of Vocational Undergraduate Professional Courses in the Context of High-quality Development of Vocational Education

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Abstract

The vocational education system is undergoing profound structural reforms. As a pivotal platform for cultivating mid-to-high-level technical professionals, vocational undergraduate programs urgently require systemic innovation in both conceptual frameworks and operational mechanisms. Curriculum development now extends beyond mere content organization to focus on shaping competency structures and defining disciplinary characteristics. This article explores three core pathways—"integration," "modularization," and "real-world application" —to reconstruct curriculum systems. Through case studies, it examines how vocational undergraduate courses can gain vitality in authentic contexts, thereby driving fundamental improvements in talent quality.

Keywords

Vocational education; vocational undergraduate; curriculum development.

1. Introduction

As "high-quality development" emerges as the defining theme of vocational education, vocational bachelor's programs – representing an advanced form of specialized education – must go beyond merely expanding academic pathways to build future-ready competency frameworks. While policy directions are becoming clearer and industry demands continue to grow, the inertia of existing curricula still hinders reform momentum. The critical challenge now lies in embedding curriculum design with real-world industrial contexts and technical requirements, from disciplinary logic and pedagogical approaches to resource allocation – a pressing issue demanding immediate resolution.

2. Focus on Type Positioning, Clarify The Direction of Curriculum Construction

In the context of vocational education advancing towards high-quality development, vocational undergraduate education, as a relatively young yet highly promising type within China's higher education system, faces dual challenges of structural reshaping and logical reconstruction in curriculum development. Unlike research-oriented universities that emphasize academic depth and traditional vocational colleges that focus on skill training, vocational undergraduate education exhibits a unique "dual integration" in its positioning: it requires both technical proficiency and innovation integration; it is grounded in engineering practices at the bottom of the industrial chain while pursuing application breakthroughs at the high end of the technological chain. These characteristics determine that its curriculum system cannot simply replicate existing approaches but must forge new paths, establishing content systems within

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the framework of its type logic and anchoring development directions within institutional contexts.[1]

The development of curriculum should be deeply rooted in the practical context of industrial restructuring and technological evolution. In an era where new productive forces are rapidly emerging and intelligent manufacturing is advancing, single-skill courses can no longer meet the specific requirements of job competencies. Vocational undergraduate education now aims to cultivate not "operational technicians," but "interdisciplinary engineering talents" with technical thinking, process integration, and systematic cognitive abilities. This presents new challenges for curriculum content selection and organization: How to balance technical application skills with project-solving capabilities? How to co-create cutting-edge process knowledge with practical operational skills? Clearly, curriculum design is no longer merely about piling up teaching content, but rather achieving precise alignment between talent profiles and job requirements. At the national level, recent policies have repeatedly emphasized strengthening the "distinctive identity" of vocational undergraduate programs. The *Vocational Education Professional Teaching Standards (2025 Edition)* positions "high-end skilled talents" as the cultivation goal of vocational undergraduate education, not only clarifying the hierarchical relationship within vocational education theoretically, but also establishing reference benchmarks for curriculum system construction. Under this positioning, course content must demonstrate the integration of technicality, comprehensiveness, and complexity, with strong transferability value and innovation potential. Meanwhile, the curriculum structure should shift from a "knowledge-centered" approach to a "competency-centered" one, forming a spiral progression path from foundational cognition to systematic application. This ensures students not only become competent but also adaptable and innovative.[2]

From a practical perspective, curriculum development should address the diversity of disciplinary logics to avoid homogenization. Currently, some vocational undergraduate institutions still adhere to the framework of "extended vocational education" or "imitation of regular undergraduate programs," neglecting the fundamental differences in curriculum objectives and teaching methodologies. The essence of curriculum design lies not in "what to teach," but in "who to cultivate." Without clearly defining the comprehensive competency paradigm students should achieve, the curriculum system risks losing its structural coherence and functional direction. Effective strategies should structure vocational competencies as the framework, with technical application scenarios as the connecting threads, building a position-adaptive and development-guided curriculum system. Returning to disciplinary origins and clarifying "for whom we teach" and "the practical value of education" constitutes the primary principle in vocational undergraduate curriculum construction. Under the trend of high-quality development, only by grasping the inherent logic and institutional boundaries of educational types can vocational undergraduate curriculum development transition from "piecemeal accumulation" to "systematic construction." This transformation will enable the sector to truly fulfill its historical mission of driving industrial upgrading and serving societal progress.

3. Highlight Integrated Innovation and Optimize The Modular Teaching System

As the vocational education system undergoes profound transformation, curriculum development is undergoing a fundamental paradigm shift. Vocational undergraduate education bears the historical mission of cultivating high-end skilled professionals. The construction of its curriculum framework must break free from the outdated logic of singular instruction and closed accumulation, adopting an innovation-driven approach to explore more flexible and open teaching design models. This not only responds to the practical demands of technological

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evolution in our era but also represents an active evolution within the inherent developmental logic of education itself.[3]

Curriculum updates should transcend mere knowledge replacement or minor chapter revisions, actively aligning with emerging industries' technological ecosystems. As smart manufacturing, digital economy, and green energy sectors rapidly evolve, the core curriculum must transition from static theories to dynamic competencies. This transformation requires instructional design to break traditional disciplinary boundaries, integrating interdisciplinary elements to create courses that transcend industry silos and bridge skill domains. For instance, previously isolated modules like "Mechanical Principles" and "Digital Control" can be restructured through project-based integration into scenario-driven competency development units. Structural optimization relies more on modular deconstruction and reorganization than simple unit division, focusing on mapping competency dimensions to occupational tasks. An ideal modular system should feature adaptive restructuring capabilities—flexibly reconfiguring modules according to student development needs while evolving with updated competency models. In practice, some institutions have developed "competency building blocks" by breaking core skills into standardized modules, enabling dynamic curriculum growth and personalized learning paths through modular combinations, nesting, and updates.

The innovation in teaching methodologies stands as the most dynamic component within the integrated innovation system. In the current landscape of rapid digital technology penetration, traditional teacher-centered instructional models have become increasingly outdated. To reshape educational scenarios, we need to adopt diverse approaches such as blended learning, immersive experiences, and interactive methods, creating a student-centered teaching cycle that follows task-driven progression and feedback-driven mechanisms. For instance, in software design courses, integrating virtual simulation tools with project-based workshop formats enables students to acquire knowledge and develop skills through real-world problem-solving, rather than merely memorizing operational procedures on blackboards and projectors.

4. Strengthen the Practical Practice, Improve Students' Comprehensive Ability

As vocational education systems advance toward higher quality standards, practical training has become increasingly vital. Serving as the bridge between theoretical knowledge and skill development, hands-on learning not only fulfills fundamental skill-building objectives but also acts as a key platform for deepening students 'understanding, integrating competencies, and cultivating holistic literacy. Particularly in vocational undergraduate programs, the authenticity of course simulations directly impacts students' technical transfer capabilities and workplace adaptability. When teaching becomes detached from real-world contexts, it fails to meet industry demands for versatile professionals with practical skills.

Truly effective practical education should be rooted in real industrial settings rather than simulated environments. Beyond classrooms, corporate workstations, experimental platforms, and technology centers must be redefined as integral components of the teaching space. In this context, school-enterprise collaboration should not merely serve as the final phase of internship arrangements but should become the starting point for curriculum design. Corporate involvement should extend beyond providing venues or case studies to deeply engage in key teaching processes—including setting course objectives, reviewing project content, and evaluating phased outcomes—thereby achieving deep integration between education and industry, as well as organic alignment between teaching and practical application. Structural reforms also manifest in innovative teaching organization methods. Traditional work-study integration often lags behind practical needs, whereas when curricula are structured around authentic enterprise task units, students can learn technical terminology,

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master process essentials, and refine operational details within production rhythm. At this stage, job responsibilities evolve from mere conceptual understanding to tangible anchors for skill development. Through immersive training, rotational assignments, and project-based assessments, students not only acquire practical skills but also reconstruct profound insights into professional roles and industry ecosystems.

The cultivation of comprehensive capabilities should not rely solely on "in-class integration," but must achieve "cross-disciplinary skill development" and "cognitive expansion" through practical environments. Handling complex operational scenarios, cross-team collaboration, and dynamic resource allocation are not only extracurricular educational resources but also crucial factors in developing technical judgment and organizational execution capabilities. Instructional design should break down disciplinary barriers, guiding students toward problem-solving rather than knowledge acquisition. By leveraging real-world projects to stimulate critical thinking and using failure feedback to shape cognitive patterns, we ultimately foster an integrated competency framework combining problem awareness, operational skills, and professional resilience. Learning through authentic experiences and growing in real-world settings constitutes the essential logic for cultivating vocational undergraduate talent. When education returns to reality, curricula gain vitality, enabling students' competencies to transcend textbooks, integrate into technical domains, and become deeply rooted in future workplace demands.

5. Summary

The essence of curriculum development lies in cultivating talent. Vocational undergraduate programs lacking practical foundations cannot effectively nurture technical application-oriented competencies. Only by aligning teaching content with industry practices, immersing instruction in real-world scenarios, and grounding evaluations in workplace contexts can we transform curricula from rigid frameworks into dynamic platforms for skill development. The breakthrough for future reforms lies not in rhetoric, but in gradual implementation through deep integration, continuous updates, and collaborative development. This approach will progressively elevate curricula from being "teachable" to becoming "credible" and "practical".

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