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Reconstruction Path and Practical Exploration of the Teacher Education Curriculum System Under the Guidance of Core Literacy

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Abstract: With the deepening of education reform oriented towards core literacy, vocational education has placed new demands on teachers' competency structures. The traditional teacher education curriculum system, primarily focused on knowledge and skill transmission, can no longer adequately meet the needs of cultivating composite technical and skilled talents. Taking the new energy vehicle technology major as an example, this paper first analyzes the connotation of core literacy and its new requirements for vocational education teachers. It then systematically proposes reconstruction paths for the teacher education curriculum system. Finally, combined with practical cases, it explores the specific application of this reconstruction path in curriculum development, teaching implementation, and teacher development, aiming to provide theoretical reference and practical models for cultivating "dual-qualified" teachers in vocational colleges in the new era.

Keywords: Core Literacy; Teacher Education; Curriculum System Reconstruction; New Energy Vehicle Technology; Dual-qualified Teachers

1. INTRODUCTION

The "National Vocational Education Reform Implementation Plan" (2025) clearly states the need to "implement the fundamental task of fostering virtue and nurturing talents, improve the educational mechanism that integrates moral education and technical skills and combines work and learning, perfect the evaluation mechanism, and standardize the entire process of talent cultivation." Core literacy, as the essential character and key abilities required for students to adapt to lifelong development and social needs, has become the benchmark guiding education reform at all levels and of all types. For the new energy vehicle industry, characterized by rapid technological iteration, the cultivation of professionals not only requires mastering cutting-edge "three electric" (battery, motor, electric control) technologies but also emphasizes the possession of core literacies such as critical thinking, systematic problem-solving, teamwork, green environmental awareness, and lifelong learning.

Teachers are the lifeline of education quality. To cultivate students with core literacy, it is first necessary to have a teaching team possessing corresponding literacy and teaching capabilities. However, the current curriculum systems for cultivating teachers in vocational colleges (including pre-service training and in-service training) mostly still follow the outdated framework of "disciplinary knowledge + educational theory + teaching practice," which is disconnected from industrial practice and pays insufficient attention to the cultivation of core literacy. Therefore, systematically reconstructing the teacher education curriculum system guided by core literacy has become an urgent task for promoting the high-quality development of vocational education. This paper takes the strategic emerging major of new energy vehicle technology as an entry point to explore the reconstruction path and practical solutions for its teacher education curriculum system.

2. New Requirements for Teachers in the New Energy Vehicle Technology Major Under the Guidance of Core Literacy

Teaching under the guidance of core literacy requires teachers to transform from knowledge transmitters into guides for student growth, designers of learning environments, and cultivators of core literacy. Specifically for the new energy vehicle technology major, teachers need to possess the following composite competency structure:

2.1 Interdisciplinary Integration Ability

New energy vehicles are the product of the intersection of multiple disciplines such as mechanics, electronics, information, and materials. Teachers need to break down traditional disciplinary barriers, be able to integrate knowledge of electrochemistry, power electronics, automatic control, computer science, artificial intelligence, etc., and design interdisciplinary learning projects.

2.2 Tracking and Transforming Technological Frontiers

Facing rapidly iterating technologies such as battery technology, intelligent driving algorithms, and fast-charging technology, teachers must possess a strong sense of lifelong learning and efficient information screening abilities, capable of transforming industrial frontier technologies into teaching resources and learning tasks.

2.3 Engineering Practice and Innovative Thinking

Teachers are not only theoretical explainers but also demonstrators of engineering practice. They need solid practical operation skills, fault diagnosis and troubleshooting abilities, and be able to guide students to think like engineers, experiencing the entire process of "analysis-design-implementation-optimization," cultivating their systemic thinking and innovation capabilities.

2.4 Literacy-based Instructional Design Ability

Able to concretize core literacy goals such as critical thinking, communication and collaboration, and social responsibility into observable, assessable teaching behaviors,

and embed them into diverse teaching activities such as project-based learning, case teaching, and simulation.

2.5 Green Development and Curriculum Ideology and Politics Education Ability

Deeply understand the significance of new energy vehicles in the national "Dual Carbon" strategy, and be able to organically integrate concepts of green, environmental protection, sustainable development, as well as ideological and political elements such as craftsmanship spirit, professional ethics, and national security concepts into the entire process of professional teaching.

3. Solutions for the Teacher Education Curriculum System Under the Guidance of Core Literacy

Based on the aforementioned new requirements, the traditional "assorted platter" curriculum system must be broken, shifting towards a new, integrated curriculum system with the cultivation of core literacy as its main thread.

3.1 Objective Reshaping

Positioning Transformation from "Technician" to "Educating Teacher"

The primary task of reconstruction is the transformation of objectives. The training objective should shift from cultivating mere "skilled technicians" or "theoretical lecturers" to cultivating "virtuous and skilled, literacy-based 'educating teachers'" who are both technical experts and education experts, and furthermore, guides for the development of students' core literacy.

3.2 Value Guidance

Building Resources Based on the "Grand Engineering View" Educational Philosophy. According to the characteristics of the new energy vehicle technology curriculum, emphasize education in online courses, strengthen practice, use typical engineering cases as carriers, integrate ideological and political elements such as master craftsman spirit,家国情怀 (patriotism and dedication), and scientific and harmonious development into the transmission of knowledge and skills, enhancing professional pride and stimulating internal motivation for learning.

Building Resources Based on Supply-Side Theory

Learner-centered, based on enterprise needs, teaching objectives, and methods, flexibly select knowledge and skill points, create learning resources with external "appeal" + internal "talent, quality" for teacher-student interaction, ensuring scientific, effective, interesting, appropriate, and aesthetically pleasing content, so that students are willing to learn, able to learn, and can improve.

Building Resources Based on Multiple Intelligences Theory.To meet the needs of the "1+X" certificate system, skills competitions, and diversified learning, considering the difficulty of the new energy vehicle technology curriculum, design online course resources in modules, levels, and steps to develop various learning potentials.

3.3 Dual-Context Integration

Establish a deep collaborative training community between "Higher Vocational Colleges --- Leading Enterprises." Course learning alternates with enterprise practice, implementing a "Dual Tutorial System" with on-campus tutors and enterprise tutors. For example, in the course "Detection and Repair of New Energy Vehicle 整车 Control Systems," arrange for students to go to the intelligent driving R&D department of an automobile company for several weeks of residency learning and project research.

"Integration of Theory, Practice, and Virtual": Through theoretical instruction, explain core concepts and principles concisely; allow students to conduct practical operations: perform actual vehicle disassembly, inspection, and fault repair in the training workshop; utilize VR/AR technology to enable students to conduct more practical operations in a safe environment, simulating real work scenarios, reducing training costs, better assessing skill levels, and breaking time and location constraints. This can help students comprehensively master maintenance operation skills, improve training effectiveness and efficiency, and achieve a closed loop of "learning by doing, doing by learning, and verifying in the virtual."

3.4 Effective Teaching

Relying on MOOC+SPOC platforms, adopt a student-centered approach, expand the dimensions of blended learning from teaching methods, teaching activities, learning content, etc., promote the deep integration of 信息化 teaching and the teaching process, and increase student learning engagement; implement teaching by considering the "blending degree of pre-class and in-class" and the "blending degree of online and offline," ensuring the effective integration of 信息化 teaching and traditional teaching, prompting students to enjoy learning and master knowledge.

Using typical automotive maintenance cases as carriers, teachers conduct process-based scoring based on the standardization of operational procedures, the effectiveness of teamwork, and the embodiment of safety awareness. Students submit reflection reports, elaborating on changes in their understanding depth of vehicle maintenance standards.

Through this complete teaching closed loop, teachers not only impart technical knowledge but also, in real work contexts, follow the path of "Four Educations Integration" – educating through culture, curriculum, activities, and practice – organically integrating them into the entire teaching process, effectively cultivating students' core literacy, and achieving the goal of cultivating skilled talents with both virtue and technical ability.

4. Conclusion and Outlook

The reconstruction of the teacher education curriculum system under the guidance of core literacy is a systematic project, far from simply adding or subtracting courses. With the fundamental goal of cultivating "educating teachers," and through the "four-dimensional integration" of course content, the "dual-context integration, integration of theory, practice, and virtual" teaching implementation, and the "process-oriented, value-added, multi-subject" evaluation guarantee, it aims to build a new, open, dynamic ecology for teacher professional development that resonates with industrial development.

Practice using the new energy vehicle technology major as an example shows that this reconstruction path can effectively respond to the new requirements for talent literacy brought by industrial transformation and provides a feasible path for building the "dual-qualified" teaching force in vocational colleges.

In the future, it is necessary for the government, universities, and enterprises to form a joint force and continue to exert efforts in policy support, resource investment, and mechanism innovation to translate this blueprint into a widespread reality, ultimately empowering vocational education to cultivate large numbers of high-quality technical and skilled talents with both virtue and technical ability for national construction.

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