

The Aspirations and Implementation Pathways for the Reform of Higher Vocational Talent Cultivation Effectiveness Evaluation Driven by Vocational Skill Certificates

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Abstract: The deepening implementation of the vocational skill certificate system has placed systematic reform demands on the evaluation of talent cultivation effectiveness in higher vocational education, calling for a shift from "knowledge-based evaluation" to "competence-based evaluation," from "single-subject evaluation" to "multi-stakeholder collaborative evaluation," and from an overemphasis on "summative evaluation" to equal emphasis on "formative and developmental evaluation." The current higher vocational evaluation system exhibits structural disconnections from the requirements of the certificate system in terms of standard alignment, stakeholder composition, and methodological approaches, making it difficult to effectively respond to the quality certification needs of skilled talent cultivation. Based on an analysis of the driving logic behind the vocational skill certificate system's impact on the reform of talent cultivation effectiveness evaluation, this paper systematically articulates the conceptual shifts that the evaluation reform should embrace. It further proposes implementation pathways including constructing a competence-oriented evaluation standard system, innovating multi-stakeholder collaborative evaluation mechanisms, promoting the integration of formative and developmental evaluation, strengthening technology-empowered and data-driven evaluation methods, and improving the application of evaluation results and feedback loops. This study aims to provide theoretical references and practical guidance for higher vocational institutions to advance the reform of talent cultivation effectiveness evaluation within the framework of the vocational skill certificate system.

Keywords: vocational skill certificate system; higher vocational education; talent cultivation effectiveness evaluation; evaluation reform; competence-based evaluation

1. Introduction

In 2019, the "National Vocational Education Reform Implementation Plan" explicitly proposed the launch of the "academic certificate + several vocational skill level certificates" system (i.e., the 1+X certificate system) [1], marking the entry of China's vocational education evaluation system into a new stage of systematic restructuring. The vocational skill certificate system integrates academic certificates with vocational skill level certificates, aiming to establish a diversified professional competence certification framework. Its underlying logic not only points to the reconstruction of the curriculum system but also imposes fundamental reform requirements on the evaluation mechanism for talent cultivation effectiveness.

Talent cultivation effectiveness evaluation serves as the core yardstick for measuring educational quality and a critical lever for guiding teaching reform directions. Driven by the vocational skill certificate system, the talent cultivation objectives of higher vocational institutions have shifted from "knowledge transmission" to "competence cultivation," the cultivation process from "disciplinary logic" to "occupational logic," and cultivation standards from "institution-determined" to "industry-certified"—these profound changes inevitably demand a synchronous transformation in talent cultivation effectiveness evaluation. As some researchers have pointed out, vocational education still faces the problem of "disconnection between education and job requirements, and misalignment between teaching and technology," and one of the key solutions lies in establishing an evaluation system for talent cultivation effectiveness that is compatible with the vocational skill certificate system.

However, the current evaluation of talent cultivation effectiveness in higher vocational institutions

still suffers from numerous issues incompatible with the certificate system requirements: evaluation standards are not closely aligned with vocational skill level standards, with a prominent "two-track" phenomenon between course assessments and certificate examinations; evaluation subjects are predominantly in-school teachers, with insufficient participation from industry and enterprises; evaluation methods overemphasize final written examinations, neglecting the formative assessment of practical abilities and professional competencies; and the application of evaluation results is confined to academic judgment, lacking diagnostic and guiding functions for student competence development. These pressing issues require higher vocational institutions to advance systematic reform of talent cultivation effectiveness evaluation from conceptual to practical levels.

Building upon previous research on curriculum system reform under the vocational skill certificate system, this paper further focuses on the critical link of talent cultivation effectiveness evaluation. It systematically elaborates the deep-seated aspirations, conceptual shifts, and implementation pathways for reforming talent cultivation effectiveness evaluation driven by the vocational skill certificate system, aiming to provide theoretical references for higher vocational institutions to construct an evaluation system compatible with the certificate system.

2. The Logic of Reform in Talent Cultivation Effectiveness Evaluation Driven by the Vocational Skill Certificate System

2.1 Institutional Implications Pointing to Evaluation Reform

The core essence of the vocational skill certificate system lies in "curriculum-certificate integration"—organically linking academic education with vocational skill level certificates [2]. The inherent requirements of this institutional design are: deep integration of professional course content with vocational skill level standards, coordinated advancement of teaching processes and work processes, and mutual articulation between academic certificates and vocational skill level certificates. Practices in pioneering regions such as Beijing demonstrate that starting from occupational competence analysis and promoting deep integration of professional course content with vocational skill level standards can achieve a matching rate exceeding 90% between professional teaching and occupational standards.

The institutional design of "curriculum-certificate integration" imposes clear directives on talent cultivation effectiveness evaluation: evaluation standards should align with vocational skill level standards; evaluation content should encompass the knowledge, skills, and competencies required by the certificates; and evaluation methods should be capable of effectively certifying students' vocational competence levels. This implies that talent cultivation effectiveness evaluation can no longer be confined to internal course assessments within institutions but must incorporate the assessment requirements of vocational skill level certificates into the evaluation framework, achieving integrated design of curriculum evaluation and certificate evaluation.

2.2 Structural Disconnections Between the Current Evaluation System and the Certificate System

Although the vocational skill certificate system has charted the direction for reforming talent cultivation effectiveness evaluation, the current evaluation systems in higher vocational institutions still exhibit notable structural disconnections.

First, there is a disconnection between evaluation standards and certificate standards. The course assessment standards in most higher vocational institutions are still organized according to disciplinary knowledge systems, lacking substantial alignment with the occupational competence standards underpinning vocational skill level certificates. Course assessments emphasize knowledge memorization and comprehension, while inadequately assessing the practical skills, problem-solving abilities, and professional competencies required by the certificates. This disconnection results in the awkward situation where "students who complete courses may not pass certificate examinations, and those who pass certificate examinations may not receive course credit recognition."

Second, there is a disconnection between the evaluation subjects and the evaluation needs. The vocational skill certificate system emphasizes the authority of industry and enterprises in competence evaluation, but current higher vocational evaluation remains dominated by in-school teachers as the sole subjects. Industry and enterprise experts have limited participation in evaluation, making it difficult for evaluation results to genuinely reflect job market demands and social recognition. As some

studies have noted, the teaching reform of "curriculum-certificate integration" faces the practical problem of "lagging evaluation mechanisms" [2].

Third, there is a disconnection between evaluation methods and the nature of competence. Vocational competence is characterized by contextuality, practicality, and comprehensiveness, and its evaluation requires diverse methods grounded in authentic or simulated work task scenarios. However, current higher vocational evaluation still relies predominantly on summative written examinations, with the "one exam determines the grade" model being prevalent, making it difficult to comprehensively and accurately assess students' vocational competence levels.

Fourth, disconnection between evaluation functions and developmental needs. The vocational skill certificate system is concerned not only with summative competence certification but also with the sustained development and dynamic updating of students' vocational competencies. However, the current evaluation system overemphasizes outcome determination, lacking process tracking and diagnostic feedback for student competence growth, with the problem of "evaluating but not using" being rather prominent.

These structural disconnections indicate that the reform of talent cultivation effectiveness evaluation in higher vocational education is not a piecemeal patchwork but requires systematic conceptual reconstruction and pathway redesign within the framework of the vocational skill certificate system.

3. Conceptual Shifts in Talent Cultivation Effectiveness Evaluation Reform

3.1 From "Knowledge-Based Evaluation" to "Competence-Based Evaluation"

Traditional higher vocational evaluation takes the degree of disciplinary knowledge mastery as the core measure, focusing on examining students' memorization, comprehension, and simple application of theoretical knowledge. This evaluation paradigm originates from the "subject-based" educational philosophy and fundamentally conflicts with the "competence-based" evaluation required by the vocational skill certificate system.

The essence of the vocational skill certificate system is the certification of vocational competence. Within this institutional framework, the core concern of talent cultivation effectiveness evaluation should be: whether students possess the knowledge, skills, and competencies required by target positions; whether they can effectively apply these competencies in authentic or simulated work tasks. This demands a paradigm shift from "knowledge-based" to "competence-based" evaluation. Competence-based evaluation takes vocational competence standards as its reference, typical work tasks as its carriers, and actual performance levels as its basis, focusing on "what students can do" rather than "what students know."

This shift entails the reconstruction of evaluation standards—from defining assessment scopes based on disciplinary knowledge systems to determining evaluation dimensions according to vocational skill level standards; reconstruction of evaluation content—from emphasizing knowledge testing to comprehensive assessment of knowledge, skills, and competencies; and reconstruction of evaluation methods—from primarily paper-and-pencil tests to integrated application of practical assessments, project evaluations, performance-based assessments, and other diverse methods.

3.2 From "Single-Subject Evaluation" to "Multi-Stakeholder Collaborative Evaluation"

In traditional higher vocational evaluation, the evaluation subjects are predominantly in-school teachers, and the authority of evaluation derives from teachers' professional judgment. However, under the vocational skill certificate system, the standards for vocational competence evaluation originate from industry and enterprise job requirements, and the authority of evaluation should derive from industry and enterprise competence certification. This change necessitates a shift in evaluation subjects from "single" to "diverse."

Multi-stakeholder collaborative evaluation means that evaluation subjects are no longer confined to in-school teachers but should include industry and enterprise experts, skill assessors, students themselves, and even social evaluation agencies, among multiple stakeholders. Industry and enterprise experts' participation in evaluation ensures effective alignment between evaluation standards and job market demands; skill assessors' participation enables organic articulation between course evaluation

and certificate examinations; and the introduction of student self-assessment and peer assessment helps cultivate students' self-reflection abilities and professional judgment.

This multi-stakeholder collaboration is not a simple aggregation of subjects but requires effective coordination across all aspects of evaluation standards, processes, and outcomes—ensuring that "enterprises have the final say, and positions reveal the truth."

3.3 From "Summative Evaluation" to Equal Emphasis on "Formative and Developmental Evaluation"

Traditional higher vocational evaluation predominantly employs summative evaluation, determining students' learning outcomes through a single examination at the end of a course or semester. This evaluation approach fails to capture students' competence growth trajectories during the learning process and cannot provide timely and effective feedback for instructional improvement.

Under the vocational skill certificate system, competence cultivation is a continuous and dynamic process, and its evaluation should run through the entire process of competence formation. As required by pilot programs of curriculum-certificate integration in Sichuan Province, an assessment system with "formative evaluation as the mainstay and summative evaluation as the supplement" should be established [3]. Formative evaluation focuses on students' performance in daily learning, practical training, and project work, enabling timely identification of weak areas in competence development and intervention; developmental evaluation focuses on students' longitudinal growth in competence, presenting the magnitude and trajectory of competence improvement through before-and-after comparisons.

The shift from summative evaluation to equal emphasis on formative and developmental evaluation essentially expands the function of evaluation from "selection and screening" to "diagnosis and promotion," making evaluation a booster for quality improvement in talent cultivation rather than merely a judgment tool.

4. Implementation Pathways for Talent Cultivation Effectiveness Evaluation Reform

4.1 Constructing a Competence-Oriented Evaluation Standard System

Evaluation standards are the core basis for talent cultivation effectiveness evaluation. Within the framework of the vocational skill certificate system, the construction of evaluation standards should take vocational competence as the logical starting point and achieve deep alignment with vocational skill level standards.

First, evaluation dimensions should be determined based on occupational competence analysis. Drawing on the standard frameworks of vocational skill level certificates and collaborating with industry and enterprise experts, we systematically analyze the competence requirements of target positions to define specific evaluation indicators across the three dimensions of knowledge, skills, and competencies. Professional competencies such as craftsmanship spirit, standardized operations, and teamwork can be broken down into quantifiable three-level indicators for quantitative evaluation. Evaluation indicators should be observable and measurable, avoiding vague and ambiguous expressions.

Second, a "competence-course-evaluation" mapping matrix should be established. Each competence unit required by the vocational skill level certificate should be mapped to corresponding course modules and evaluation links, ensuring that assessments for each course effectively cover the corresponding certificate competence requirements. This mapping relationship should be clearly accessible, enabling both teachers and students to understand "what is tested, how it is tested, and what standards qualify as passing."

Third, course assessment standards should be integrated with certificate assessment standards. The assessment content of vocational skill level certificates should be incorporated into course standards, making course assessments an integral part of competence certification. Through mechanisms such as "embedding standards in courses and quantifying points through processes," the entire process of course teaching, skills training, and certificate recognition can be interconnected. Students who pass course assessments can apply for corresponding vocational skill level certificates as stipulated, truly achieving "curriculum-certificate integration."

4.2 Innovating Multi-Stakeholder Collaborative Evaluation Mechanisms

The diversification of evaluation subjects is a key safeguard for achieving objectivity and authority in evaluation. A multi-stakeholder collaborative evaluation mechanism comprising "professional teachers + enterprise mentors + skill assessors + student self- and peer-assessment" should be established.

Professional teacher evaluation serves as the foundation of the evaluation system. Teachers should conduct regular assessments of students' course learning, skill acquisition, and project work based on competence-oriented evaluation standards. Meanwhile, teachers should continuously enhance their certificate training capabilities and practical teaching competencies, obtaining corresponding assessor qualifications to ensure intrinsic consistency between teacher evaluation and certificate assessment standards.

Enterprise mentor evaluation is the critical link for achieving "job requirements have the final say." In modern apprenticeship programs, internships, and other practical settings, enterprise mentors should be introduced to conduct formative evaluations of students' job skill levels, work discipline, and professional attitudes. Practices in some institutions show that enterprise mentor evaluation data accounts for 40% of total practical teaching evaluation [4], genuinely aligning evaluation with job market demands.

Skill assessor evaluation serves as the bridge connecting course evaluation and certificate examinations. Assessors qualified in vocational skill level certificate evaluation should be invited to participate in practical training assessments and comprehensive competence evaluations, ensuring consistency between evaluation standards and certificate assessment standards.

Student self-assessment and peer assessment are important approaches for cultivating students' self-reflection abilities and professional judgment. In group projects, practical training, and other activities, self- and peer-assessment mechanisms can be introduced, with evaluation dimensions including collaboration skills, task contribution, and professional competencies.

4.3 Promoting the Integration of Formative and Developmental Evaluation

The reform of evaluation methods should shift from a single summative evaluation to a composite model of "formative evaluation as the mainstay, supplemented by summative evaluation."

At the formative evaluation level, evaluation should be embedded throughout the entire process of course teaching, practical training, and project work. Formative assessments can cover multiple dimensions including class participation, practical training performance, group projects, and assignment completion. Daily assignments and training reports can be converted into evaluation points. Through full-process data collection and recording, a dynamic portfolio of student competence growth can be formed.

At the level of developmental evaluation attention should be paid to before-and-after comparisons and longitudinal growth in student competence. A three-stage evaluation process of "baseline competence testing—periodic competence assessment—summative competence certification" can be established, presenting the magnitude and trajectory of competence improvement through comparative analysis. The core value of developmental evaluation lies not in horizontal comparison but in vertical diagnosis—helping students understand "where they came from, where they are going, and what they still lack."

In terms of evaluation structure, a combination of "formative assessment + summative assessment" can be adopted. Some institutions have explored a course evaluation structure of "50% formative assessment + 50% summative assessment," attending both to competence accumulation during daily learning and the assessment of comprehensive application abilities and practical problem-solving skills. Summative assessments should emphasize comprehensiveness and contextuality, avoiding simple knowledge-recall tests.

4.4 Strengthening Technology-Empowered and Data-Driven Evaluation Methods

The development of digital technologies offers new possibilities for precision and intelligence in talent cultivation effectiveness evaluation. Information technology should be actively leveraged to promote the shift from "experience-driven" to "data-driven" evaluation [5].

First, build an integrated evaluation data platform. Integrate multi-source data from smart teaching platforms, practical training management systems, certification platforms, and competition management systems to comprehensively collect and integrate data on students' learning behaviors, practical training performance, competition results, and certificate acquisition. Through data integration, break down information silos among various systems to form a panoramic profile of students' competence development.

Second, introduce intelligent evaluation tools. Use AI-empowered digital review tools to evaluate project outcomes and to integrate and intelligently assess multi-dimensional data, including vocational skill certificate acquisition rates, the quality of enterprise project completion, and cross-disciplinary collaboration performance. The application of these technologies can significantly enhance the objectivity and precision of evaluation.

Third, construct a big data evaluation system. Integrate position competence requirements, course learning performance, skills competition results, and certificate examination outcomes into a unified evaluation framework, generating dynamic and personalized competence profiles for each student. Competence profiles not only present current skill levels but also analyze development potential, diagnose weak areas, and recommend personalized learning pathways through data analysis.

4.5 Improving the Application of Evaluation Results and Feedback Loops

The value of evaluation lies not only in "producing results" but more importantly in "promoting improvement." A management closed loop of "precise assessment—teaching supervision—evaluation feedback—improvement and enhancement" should be established [5].

At the feedback level of evaluation results, results should be promptly delivered to teachers and students through the platform. The teacher interface presents class learning analytics, teaching effectiveness diagnoses, and improvement recommendations, providing a basis for teaching strategy adjustments; the student interface presents personal competence profiles, academic early warnings, and development recommendations, offering direction for autonomous learning. Enterprise mentors can also simultaneously access students' practical performance evaluation records.

In terms of the application of results, results should be effectively linked to teaching improvement, curriculum optimization, student development guidance, and other aspects. Based on evaluation data, establish a closed-loop improvement mechanism of "issue registry—rectification measures—effect tracking." Each semester, special teaching and research activities on evaluation reform can be convened, with collective review of evaluation data, revision of course standards, optimization of teaching content, and adjustment of teaching methods.

At the learning outcome recognition level, evaluation results should be linked to credit recognition and certificate acquisition. Students who pass course assessments can obtain corresponding course credits and may apply for vocational skill level certificates as stipulated. The theoretical and practical assessment results of vocational skill level certificates can be directly recognized as corresponding course grades [6]. This "certificate-in-lieu-of-examination" mechanism not only reduces students' academic burdens but also enhances the relevance and effectiveness of evaluation.

At the social application level of evaluation results, skill level recognition results should be incorporated into students' graduation, awards, further studies, and other aspects, and serve as important references for employment recommendations. Through the social application of evaluation results, we enhance the social recognition and value of vocational skill certificates, forming a virtuous cycle of "evaluation guides learning—learning enhances competence—competence gains certification—certification promotes employment."

5. Conclusion

The vocational skill certificate system not only drives profound reform of higher vocational curriculum systems from "subject-based" to "competence-based" but also imposes the contemporary demand for systematic reconstruction of talent cultivation effectiveness evaluation [7]. From the reconstruction of evaluation standards, expansion of evaluation subjects, and innovation of evaluation methods to the upgrading of evaluation means, the reform of talent cultivation effectiveness evaluation involves comprehensive renewal across evaluation concepts, systems, and technologies. It should be noted that the reform of talent cultivation effectiveness evaluation and curriculum system reform are

mutually reinforcing organic wholes—curriculum reform provides the content foundation for evaluation reform, while evaluation reform provides quality assurance for curriculum reform. Different majors and institutions should explore reform pathways suited to their own characteristics, industrial contexts, and institutional conditions when advancing evaluation reform. Future research may further focus on the effect assessment of evaluation reform implementation, differentiated strategies for evaluation reform across different professional clusters, and the deeper impacts of emerging technologies such as artificial intelligence on evaluation reform, so as to promote theoretical deepening and practical expansion of talent cultivation effectiveness evaluation reform under the vocational skill certificate system.

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