

Research on the Evaluation and Monitoring of High-Quality Development of Higher Vocational Education

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Abstract: Against the backdrop of advancing high-quality development of education and deepening education evaluation reform in China, constructing a scientific evaluation and monitoring system is of great significance for higher vocational colleges to improve quality and pursue excellence. Based on index theory, multi-dimensional quality outlook of higher vocational education and Outcomes-Based Education (OBE) theory, this paper interprets the connotation of higher vocational education quality, and identifies six core quality dimensions: social adaptability, condition guarantee level, process compliance level, achievement satisfaction, service contribution and brand influence. It establishes a hierarchical quality index framework consisting of primary-secondary-tertiary indicators and adopts the CRITIC weighting method for index measurement. An empirical study is conducted with data from 72 higher vocational colleges in Shandong Province during 2019-2023. The results reveal temporal fluctuations in the comprehensive quality index of higher vocational education in the sample region, imbalanced quality development across different college types and regions, and quality warning risks in partial indicators and institutions. Accordingly, this paper proposes quality improvement approaches including the formulation of internal institutional standards, construction of outcomes-oriented classrooms and reform of teaching evaluation. A multi-level quality monitoring mechanism is further designed from the perspectives of monitoring objects, indicators, data collection and graded early-warning, so as to provide references for competent education authorities in policy-making and for higher vocational colleges in quality improvement.

1. Research Background and Value

Against the era background of high-quality education development and deepening education evaluation reform in China, higher vocational education serves as a key carrier for cultivating high-quality technical and skilled talents and supporting regional industrial upgrading. Its quality improvement and scientific monitoring have become an urgent issue of the times. As an intuitive and quantitative evaluation tool, indexes have gradually expanded from the economic field to social

and educational sectors, offering an effective approach for comprehensive characterization of educational quality.

Research on the evaluation and monitoring of high-quality development of higher vocational education bears both academic and practical values. Academically, grounded in the new-era higher education concepts such as outcomes-oriented philosophy, this study clarifies the connotation and key elements of higher vocational education quality, and constructs a scientific quality index evaluation system, which enriches the theoretical system of vocational education and higher education quality evaluation. Practically, through quantitative monitoring data and visual presentation, it can provide decision-making references for education competent authorities to promote quality improvement and excellence initiative of vocational education. It also helps higher vocational colleges accurately identify quality weaknesses and deliver practical foundations for quality improvement, which complies with policy documents including National Vocational Education Reform Implementation Plan and Action Plan for Improving Quality and Pursuing Excellence in Vocational Education (2020-2023).

2. Core Theoretical Foundations

2.1 Index Theory

An index is a relative number measuring the comprehensive changes of multiple variables. Its core lies in converting complex and diverse evaluation data into comprehensible composite indicators via standardization and weight assignment. Three core issues must be addressed in index compilation: indicator selection should balance representativeness and operability; weight determination includes subjective weighting methods (Delphi method, Analytic Hierarchy Process) and objective weighting methods (CRITIC method, Principal Component Analysis)^{[1][2]}; in calculation, data standardization is applied to eliminate dimensional differences before weighted synthesis of indexes at all levels.

2.2 Quality Outlook of Higher Vocational Education

The quality outlook of higher vocational education is multi-dimensional. At the institutional level, the “grand quality” concept emphasizes the extensiveness of quality scope, the unity of results and processes, and the integrity of organizations and systems. From the stakeholder perspective, the multi-agent quality outlook reflects divergent demands for educational quality from students, parents, employers, governments and other groups, forming dynamic quality appeals. For regulators, the new-era quality outlook centers on “student-centered, outcomes-oriented and continuous improvement”, highlighting the adaptability between students’ learning outcomes and social demands.

2.3 Outcomes-Based Education Theory

Proposed by American scholar Spady^[3] in 1981, Outcomes-Based Education (OBE) features “student-centered, outcomes-oriented and continuous improvement”. It advocates reverse design of curriculum systems and teaching procedures based on students’ learning outcomes, and realizes sustained quality enhancement through whole-process evaluation and feedback. Highly consistent with the inherent “vocational and practical” attributes of higher vocational education, this theory provides critical theoretical support for the transformation of quality evaluation from input-orientation to outcomes-orientation.

3. Connotation and Key Elements of Higher Vocational Education Quality

3.1 Connotation of Quality

Higher vocational education quality refers to the degree to which its inherent educational service characteristics meet explicit requirements, implicit requirements and mandatory obligations. Explicit requirements correspond to national school-running standards; implicit requirements refer to the cultivation of professional literacy; mandatory obligations focus on the fundamental task of fostering virtue through education. The high-quality development of higher vocational education is mainly reflected in three dimensions: depth of integration between industry and education, cultivation quality of high-quality technical and skilled talents, and capacity for applied technology research and social services.

3.2 Key Quality Elements

From the perspectives of university functions, internal quality assurance systems and national supervision, the key quality elements of higher vocational education are condensed into six dimensions^[4]:

(1) Social adaptability: it reflects the matching degree between talent cultivation and social demands, embodied in indicators such as graduates' employment, entrepreneurship and adaptation to regional industries.

(2) Condition guarantee level: it denotes the compliance level of basic school-running conditions, covering core indicators including teacher structure, practical teaching facilities and fund input.

(3) Process compliance level: it demonstrates the implementation effect of school-enterprise collaborative education, including key links such as joint curriculum development by schools and enterprises and practical teaching implementation.

(4) Achievement satisfaction: it represents the realization of training objectives and recognition from stakeholders, involving satisfaction of students, faculty, employers and other participants.

(5) Service contribution: it measures institutional support for regional economic and social development, including technical services, social training and transformation of scientific research achievements.

(6) Brand influence: it shows comprehensive institutional strength and social reputation, consisting of high-quality teaching resources, awards in skill competitions, teaching achievements and other outputs.

4. Construction and Measurement Practice of Quality Index

4.1 Principles and Framework for Index Construction

The construction of higher vocational education quality index follows five principles: distinct quality orientation, clear index hierarchy, accessible public data, transparent calculation methods, and readable and visual results. The index system adopts a hierarchical structure of "primary indicator-secondary indicators-tertiary indicators". The primary indicator stands for higher vocational education quality; the secondary indicators are the six key quality elements; the tertiary indicators are quantifiable specific metrics under each element, forming a multi-dimensional indicator matrix covering talent cultivation, school-running conditions and social services.

4.2 Weight Determination and Calculation Methods

In existing studies, indicator weighting has shifted from predominant subjective weighting to the combination of subjective and objective weighting. The CRITIC method is widely adopted in constructing vocational education quality indexes for its capacity to consider both indicator volatility and conflicts^[5]. The index calculation proceeds as follows: first, tertiary indicator data are standardized by the extremum method and converted into values ranging from 60 to 100; second, weights of tertiary indicators are calculated via the CRITIC method to synthesize secondary indicator indexes; finally, the comprehensive quality index is obtained through weighted synthesis of secondary indicators.

4.3 Empirical Measurement Results

Empirical evidence from higher vocational education in Shandong Province shows the following findings.

In terms of temporal quality, the comprehensive quality index fluctuated from 2019 to 2023. Higher quality levels were observed in 2020 and 2022. In 2023, the index dropped to 70.97 due to declines in indicators such as employment rate and international exchanges. Among the six key elements, process compliance level kept decreasing year by year, while achievement satisfaction maintained continuous growth after 2021.

In terms of cross-sectional quality in 2023, significant quality gaps existed among the 72 sampled colleges. Three institutions including Shandong Institute of Commerce and Technology scored above 80 in the comprehensive index, and nine colleges received severe quality warnings due to quality deficiencies. The average comprehensive index of public colleges (74.97) was markedly higher than that of private colleges (71.38). Regional vocational education development was unbalanced across prefecture-level cities, with Binzhou and Jining taking the lead. The internal quality gap among colleges within certain cities exceeded 17 points.

5. Quality Improvement Paths and Monitoring Mechanism

5.1 Quality Improvement Paths

Establish internal institutional standards: build a standardization system covering training carriers, talent cultivation procedures, administration and services, campus environment, connotation-building outcomes and faculty responsibilities, so as to standardize quality control.

Develop outcomes-oriented classrooms: design a “7+6” classroom teaching framework centered on teaching objectives, tasks, philosophies, strategies, procedures, improvement and requirements, and strengthen the correlation between teaching procedures and learning outcomes.

Improve outcomes-oriented teaching evaluation: highlight process-oriented assessment, develop evaluation criteria for learning outcomes, optimize curriculum objectives and outcome representation forms, and establish a closed-loop mechanism of “evaluation-diagnosis-improvement”.

5.2 Design of Quality Monitoring Mechanism

(1) Necessity of Mechanism Construction

Against the backdrop of the type-specific development of vocational education, establishing a systematic quality monitoring mechanism is a practical choice to implement national policy requirements and shore up weaknesses in higher vocational college governance. From a policy

perspective, the state has successively issued a series of documents including the National Implementation Plan for Vocational Education Reform and the Action Plan for Improving the Quality of Vocational Education (2020-2023). These documents explicitly require improving a multi-stakeholder quality supervision and evaluation system, leveraging big data to build a quality monitoring network covering the entire education delivery process. Conducting regular quality assessment of higher vocational education has become a mandatory policy requirement.

In terms of the practical realities of industry-run vocational education, the scale of higher vocational education keeps expanding. Colleges vary greatly in educational foundation, institutional positioning and resource endowments. Quality gaps objectively exist between public and private colleges, as well as institutions in different prefecture-level cities. The traditional model mainly relies on self-reported institutional reports and periodic supervision inspections, lacking quantitative tools for continuous time-series tracking and horizontal comparison. Building a monitoring mechanism based on quality indices can convert scattered school-running data into comparable and evaluative comprehensive results, enabling administrative authorities to move beyond fragmented information and gain an overall picture of higher vocational education quality across the region.

Meanwhile, the monitoring mechanism also meets the internal needs of higher vocational colleges for self-diagnosis and continuous improvement. Previously, colleges mostly only had access to their annual school-running data without benchmarks against peer institutions, making it hard for them to accurately identify their own quality deficiencies. A multi-level monitoring system can support macro administrative decision-making, regional coordinated governance and institutional internal self-reflection simultaneously. It closes the full loop of "monitoring-diagnosis-improvement", and drives the transformation of higher vocational quality governance from ex-post supervision to early warning and process-based control.

(2) Current Status and Main Deficiencies of Existing Monitoring

At present, talent-training status data and annual quality reports constitute two major basic monitoring materials. Nevertheless, several practical deficiencies remain. First, raw data are merely submitted without in-depth index-oriented processing, which restricts cross-college and cross-year comparative analysis. Second, inconsistent statistical calibers result in data fragmentation and repeated reporting burdens for vocational colleges. Third, quality reports are generally lengthy and difficult to interpret, lacking built-in risk early-warning functions. Fourth, the linkage between monitoring outputs and resource allocation, rectification as well as accountability is insufficient, giving rise to the phenomenon of "valuing data collection over practical application".

(3) Monitoring objects: three levels including individual higher vocational colleges, regional vocational education and national vocational education. Both temporal changes and cross-sectional disparities are monitored.

(4) Monitoring indicators: refine quantifiable and accessible indicator systems based on the six key quality elements, and dynamically optimize indicators in response to industrial development and policy adjustments.

(5) Data collection: integrate data from talent cultivation status databases and annual quality reports of higher vocational colleges, and build a regular data collection and sharing mechanism.

(6) Early-warning and application: determine early-warning thresholds by the 3σ method, and classify warnings into four grades: severe, moderate, mild and no warning^{[6][7][8]}. Establish a three-level index release and application system at national, local and institutional levels. Take monitoring results as an important basis for policy formulation, resource allocation and merit-selection evaluation.

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