

Design of Curriculum Evaluation System Based on the Eight Principles of Quality Management in Higher Vocational Colleges

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Abstract—In view of the unclear level and incomplete contents of curriculum evaluation system in higher vocational colleges, a multi-angle, multi-direction and multi-level curriculum evaluation system is proposed. Based on the eight principles of quality management, this paper discusses the principles of curriculum evaluation system design. Based on this, the basic framework of the curriculum evaluation system is provided in terms of curriculum design, curriculum implementation, and curriculum effectiveness. The evaluation criteria and implementation method of the constituent indicators are also analyzed based on relevant quality management knowledge. It provides guidance for the design of curriculum evaluation system in higher vocational colleges.

Keywords—Curriculum evaluation system design; Eight principles of quality management; Design principles; Vocational colleges

I. INTRODUCTION

Curriculum evaluation refers to an activity that, based on certain evaluation criteria, collects relevant information systematically, adopts various qualitative and quantitative methods, and makes value judgments on related issues such as curriculum planning, implementation, and results and seeks for improvement [1]. The curriculum evaluation can effectively identify and solve the teaching problems, which is an important means to improve the teaching quality. Establishing a scientific curriculum evaluation system is the prerequisite for the success of the curriculum reform.

With the in-depth development and extensive application of quality management theory, more and more modern quality management methods (such as 6 Sigma, TPM, etc.) are applied to educational institutions to achieve effective control and continuous improvement of educational quality. The design of curriculum evaluation system is an important aspect. For example, Chen Xudong [2] has constructed a quality supervision and evaluation system for higher vocational courses from five aspects, including management responsibilities and quality system documentation, etc.; Dai Qichang [3] has conducted a research on the teaching quality monitoring of higher vocational education from three aspects: teaching input, teaching operation and teaching output. Wang

Ting [4] and Li Yuanyuan [5] also carried out corresponding research.

Based on the eight principles of quality management in the ISO 9000 quality management system, this paper discusses the design principles of the curriculum evaluation system in higher vocational colleges and combines related quality management knowledge from three aspects: curriculum design, curriculum implementation and curriculum effectiveness. It creates a curriculum evaluation system template.

II. THE DISCUSSION OF EIGHT PRINCIPLES OF QUALITY MANAGEMENT AND THE DESIGN PRINCIPLES OF CURRICULUM EVALUATION SYSTEM

The eight principles of quality management are the basis of the ISO 9000 quality management system standards, including: Focus on Customs, Leadership, Total People, Process, System, Continue improvement, Fact-based, and supplier [6].

The eight principles can be summed up in three categories: Focus on Customs, Three person-related factors and four methods. These three categories are used to discuss the principles of curriculum design in higher vocational colleges.

A. Focus on Customs

Focus on Customs: Organizations depend on their customers, so organizations should understand their customers' current and future needs, satisfy customers' needs and strive to exceed customers' expectations. This principle profoundly reflects the connotation of ISO 9000 quality and it is the core of the eight principles of quality management. In the curriculum evaluation, the customers are the students, and the design of the curriculum evaluation system in the higher vocational colleges should be "focusing on cultivating students' comprehensive abilities", through the rational planning of the curriculum content, the selection of appropriate teaching methods, etc to train students' basic skills of the actual operation, read writing, data analysis, etc, to meet the needs of employers for higher vocational college students.

B. Personnel factors

The "Three person-related factors" in the eight principles of quality management are:

Leadership: The leaders establish and organize mutual unity of purpose, direction, and internal environment. The environment that they establish enables employees to participate fully in the activities of organization's goals. W.Edwards.Deming, a well-known quality management expert, believes that most of the quality-related issues can only be resolved through management rather than the staff. This principle precisely reflects the core of W.Edwards.Deming's philosophy. The design of the curriculum evaluation system in higher vocational colleges should be "correctly led and actively participated by the school leadership." Principals of the school and the presidents of all colleges should attach great importance and participate in the process of curriculum evaluation system design, and provide guidance suggestion and create necessary conditions for the design of the system.

Total People: All levels of staff are the root of the organization. Only their full participation can enable their talents to bring benefits to the organization. In the evaluation of the curriculum, participants include students, teachers, and educational administrators. The design of the curriculum evaluation system in higher vocational colleges should "fully consider the interests and opinions of the students, teachers, and educational administrators", and mobilize them through simplification of processes and reward mechanisms. The enthusiasm of all parties to achieve the transition from passive participation to active participation.

Suppliers: Organization and supplier maintaining a mutually beneficial relationship can enhance the ability of both organizations to create value. In the curriculum evaluation, the supplier is the employment unit, and the design of the curriculum evaluation system in the higher vocational college should be "closely related to the employment unit". The evaluation method and content should reflect the relevance to the employment unit, such as whether the curriculum content is in line with the demand of the employment unit.

C. Four Methods

The "Four Methods" in the eight principles of quality management are:

Process: Manage relevant resources and activities as a process to achieve the desired purpose more efficiently. At present, curriculum evaluation systems in many higher vocational colleges still focus on finality evaluation and have little effect on the evaluation of the process. The design of the curriculum evaluation system in higher vocational colleges should "increase the supervision and control of the teaching process" and design a feasible process evaluation methodology, such as adopting a reasonable listening system, can effectively evaluate the teaching process.

System: Aiming at the setting goals, identifying, understanding, and managing a system of interconnected

processes are conducive to improving organizational effectiveness and efficiency. The design of curriculum evaluation system in higher vocational colleges should "form a systematic process of identification, analysis and design", aiming at the objectives of curriculum evaluation, comprehensively identify all factors influencing the quality of the curriculum, and systematically analyze and select appropriate evaluation methods and proceed curriculum Evaluation System Design.

Continuous Improvement: Continuous improvement is an eternal goal of an organization. American education evaluation expert Stufflebeam believes that "The most important intention of the evaluation is not to prove it, but to improve it." The design of the curriculum evaluation system in higher vocational colleges should "form the PDCA cycle to achieve continuous improvement", plan and implement of the curriculum evaluation system organizationally, regular inspection of its effectiveness, timely detect and process of the problems and deficiencies of the current curriculum evaluation system to achieve continuous improvement.

Fact-based: Effective decision-making is based on the logical and intuitive analysis of data and information. The design of curriculum evaluation system in higher vocational colleges should be "based on the actual operation of the system", and extensively collect data and information of the current curriculum evaluation system and participants' suggestions, and clarify the design direction and key points on the basis of adequate information mastering and analysis.

To sum up, the design of the curriculum evaluation system in higher vocational colleges should focus on promoting the cultivation of students' comprehensive abilities; the leadership of the school should correctly guide and actively participate; the interests and opinions of students, teachers, and educational administrators should be fully considered; maintain close ties with employment units; increase supervision and control of the teaching process; form system processes for identification, analysis, and design; form a PDCA cycle to achieve continuous improvement and based on the actual system operation as basic design principles.

III. CURRICULUM EVALUATION SYSTEM DESIGN IN HIGHER VOCATIONAL COLLEGES

The life cycle of a product is divided into three stages: design, manufacture, and use. The curriculum is also the same. Combining the above design principles, it is divided into three modules: curriculum design, curriculum implementation and curriculum effectiveness to design the curriculum evaluation system in higher vocational colleges.

A. System Framework

The basic framework of the curriculum evaluation system is shown in Figure 1.

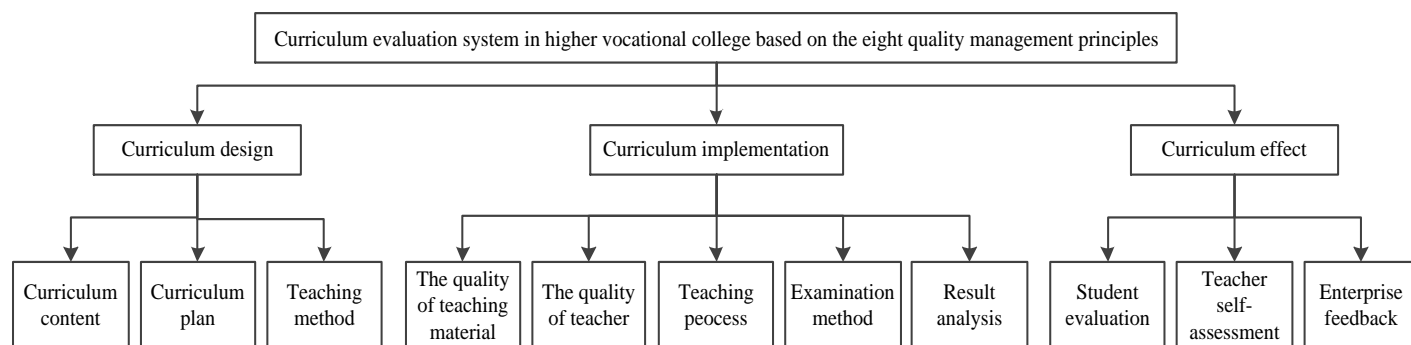


Fig. 1. Basic framework of curriculum evaluation system in higher vocational colleges

The curriculum evaluation system consists of two indicators, including 3 first-level indicators and 11 second-level indicators.

Curriculum design plays a decisive role in the quality of a course, but it is often the most easily overlooked part of the curriculum evaluation system. In the curriculum design module, the curriculum content, curriculum plans and teaching methods are three essential evaluation elements, therefore, they are included in the curriculum evaluation system.

The implementation of the curriculum is evaluated in terms of input, process and output. Input evaluation mainly considers the quality of teaching materials and the level of teachers. Process evaluation refers to whether the teaching process can achieve the expected goals, and the output evaluation mainly considers the assessment methods and conclusion analysis. Therefore, these five indexes constitute the secondary indicators for the implementation of the curriculum.

The effect of the curriculum is evaluated through tripartite review to obtain more comprehensive and more realistic evaluation conclusions. The module includes three secondary indicators of student evaluation, teacher self-assessment, and corporate feedback.

B. Indicator Evaluation Standards

Based on the principles of curriculum evaluation system design in higher vocational colleges, the evaluation criteria of the indicators are determined as shown in Table 1.

C. Implementation Method

The evaluation system of this curriculum implements the qualitative and quantitative evaluation of the curriculum mainly through research and analysis, checklist design and curriculum evaluation system design.

At the curriculum design stage, curriculum teachers formulate curriculum syllabuses based on curriculum content, curriculum planning and teaching methods. Educational administrators collect relevant materials and organize academic leaders, business representatives, teacher representatives and student representatives to hold seminars to discuss relevant factors, evaluate the conclusions and point out the direction of improvement.

In the implementation phase of the curriculum, irregular listening mechanisms are adopted to rationally design the “list of comments” to check and evaluate the quality of the teaching materials, the level of teachers, and the teaching process. Educational administrators collect statistics on the assessment methods and conclusions of the courses and organize relevant personnel to evaluate its rationality and effectiveness.

TABLE I. CRITERIA FOR EVALUATION OF CURRICULUM EVALUATION SYSTEM IN HIGHER VOCATIONAL COLLEGES

First-level indicators	Secondary indicators	Evaluation criteria
curriculum design	curriculum content	Meet the needs of the actual work of the job, close to the enterprise, close to technology, close to practice
	curriculum plan	Content planning is gradual and time lines are reasonable to ensure the successful completion of the tasks
	teaching methods	Flexible and changeable methods, targeted adoption of work-study alternatives, task-driven modes, etc.
curriculum implementation	Teaching material quality	Closely focus on the content of the curriculum, select the latest and most cutting-edge technical materials or edit the textbook
	Teacher level	Strong professional knowledge of teachers, professional skills, strong teaching skills, correct attitude
	Teaching process	Student-centered, case-based analysis based on requirements, etc, provide the link of mentoring
	Assessment method	Based on the objectives of the curriculum, effective evaluation will be implemented by using practical operations, curriculum reports, etc.
	Conclusion analysis	Organize and analyze assessment results in a targeted manner to identify problems and correct them in a timely manner
curriculum effect	Student evaluation	Student's evaluation of curriculum content, teaching methods, teaching effectiveness and other elements
	Teacher self-evaluation	Teachers' self-examination of elements such as curriculum content, curriculum planning and teaching process
	Enterprise feedback	Enterprise's comprehensive feedback on the professional skills and working ability of on-the-job students

In the curriculum effect stage, different "teaching effect evaluation tables" are designed from the perspectives of students, teachers and enterprises, and an operable and highly applicable curriculum evaluation system is formed accordingly. Educational administrators organize related personnel to conduct courses at an appropriate time. The effect evaluation gives the system a comprehensive evaluation conclusion.

Through the brief analysis of the above-mentioned system framework design, index evaluation standard formulation and system implementation method, a multi-angle, multi-direction, multi-level curriculum evaluation system for higher vocational colleges is constructed.

IV. CONCLUSION

Based on the eight principles of quality management, this paper proposes the principles of curriculum evaluation system design. Based on this, it forms the basic framework of the curriculum evaluation system composed of the three modules, curriculum design, curriculum implementation and curriculum effectiveness, and the evaluation criterion and realization method of its constituent index are briefly summarized,

provides a good template for the design of the curriculum evaluation system in higher vocational colleges.

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