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## IMPLEMENTATION OF AN INNOVATIVE INDEX SYSTEM IN THE MANAGEMENT OF VOCATIONAL EDUCATION INSTITUTIONS IN CHINA

## ВПРОВАДЖЕННЯ ІННОВАЦІЙНОЇ СИСТЕМИ ІНДЕКСІВ В УПРАВЛІННЯ ЗАКЛАДАМИ ПРОФЕСІЙНОЇ ОСВІТИ КИТАЮ

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With the rapid development of China's economy, vocational education in China must have a teaching staff with high comprehensive quality, strong teaching ability, and the ability to adapt to the development needs of vocational education in China. It is extremely urgent to solve the problems of unreasonable structure and low teaching quality in the construction of teaching staff in vocational education institutions. Building a scientific and standardized evaluation index system for the construction of vocational education institutions' teaching staff, objectively evaluating and accurately identifying existing problems, is an important way to solve the problems in the construction of vocational education institutions' teaching staff. This study combines the latest research results on the construction of teaching staff in China's vocational education, analyzes the current situation of vocational education development, innovates the indicator system for evaluating the level of teaching staff construction in Chinese vocational education institutions, and provides a new direction for thinking about how to do a good job in teaching staff construction in Chinese vocational education institutions. Assessment indicators are proposed for the formation of teaching staff in vocational education institutions through the introduction of measurement in four vectors, namely, the optimization of the structure of teachers, the system of teacher evaluation, a dual employee, the formation of a professional structure through education reform.

**Keywords:** management, institutions of professional education, innovative system of indicators, evaluation.

Стаття присвячена актуальним питанням впровадження інноваційної системи індексів в управління закладами професійної освіти Китаю. Зі швидким розвитком економіки Китаю професійно-технічна освіта в Китаї повинна мати викладацький склад з високою всебічною якістю, сильними викладацькими здібностями та здатністю адаптуватися до потреб розвитку професійно-технічної освіти країни. Вкрай актуальним є вирішення проблем необґрунтованої структури та низької якості викладання у формуванні науково-педагогічних кадрів закладів професійно-технічної освіти. Побудова науково-стандартизованої індексної системи оцінювання формування педагогічних кадрів закладів професійної освіти, яка об'єктивно оцінює, чітко визначає наявні проблеми, є важливим напрямком вирішення проблем управління кадрами в закладах професійної освіти. Стаття об'єднує результати останніх досліджень щодо побудови викладацького складу в професійно-технічних навчальних закладах Китаю, аналізується поточна ситуація розвитку професійно-технічної освіти. Запропоновано індикатори оцінки для формування педагогічного персоналу в закладах професійної освіти через запровадження вимірювання в чотирьох векторах а саме оптимізацію структури викладачів, систему оцінювання викладачів, дуальний співробітник, формування професійної структури через реформу навчання. Інноваційна система показників для оцінки рівня формування викладацького складу в китайських закладах професійної освіти пропонує новий напрямок для якісного виконання завдань при формуванні науково-ви-

кладацького персоналу через оптимізацію структури викладацького складу, серед базових важелів виділяють вікову та освітню структуру, структуру професійних заслуг і структура знань. Характеристики компетенції дуального викладача, використовуються для оцінки ефективності побудови викладацької команди та формування здібностей формують через показники статус викладацької роботи, статус наукового дослідження, статус практичних здібностей, етика та стиль викладача. У цьому дослідженні вказано на моменти управління, на які необхідно звернути увагу в процесі впровадження інноваційної системи індексів в управління закладами професійної освіти, відповідно до проблем, які потребують вирішення та запропоновано професійна конструкція та реформування навчання через відповідні програми підготовки талантів, методів навчання перегляд і адаптації системи навчальних програм.

**Ключові слова:** управління, заклади професійної освіти, інноваційна система показників, оцінювання.

**Formulation of the problem.** The construction of the teaching staff refers to the integration of the human resources status of the teaching staff through a series of planned and organized management activities related to teaching and daily management in vocational education institutions, in order to better cultivate, hire, and promote teachers, and maximize their value by placing them in more suitable positions, thus achieving the management goal of optimizing the teaching staff. The level of personnel management in vocational education institutions can often be determined by the quality of teaching staff construction [1]. It can be said that evaluating the level of teaching staff construction in a vocational education institution indirectly evaluates the ability and level of personnel management in the institution.

It is not easy to build a teaching staff with strong academic ability, good teaching effectiveness, and good continuous learning and development. Because the construction of the teaching staff involves many aspects, such as teacher assessment and incentive systems, teacher admission systems, and teacher training systems. The essence of teacher team construction is to effectively develop teacher resources, achieve reasonable allocation and full utilization of teacher resources, and continuously optimize and update the educational structure, professional title structure, and age structure during the construction process [2]. Through scientific management, effective development, and rational utilization of teacher resources, the individual needs of teachers are aligned with the development goals of vocational education institutions, greatly mobilizing teachers' work enthusiasm, enabling both to develop together and achieve win-win results.

**Analysis of the latest research and publications** Currently, vocational education institutes have reached a consensus on the importance of incorporating information technology to improve the quality of teaching in vocational education. However, there are

several challenges that need to be addressed throughout the teaching process, including the establishment of teaching infrastructure and the development of management software. While experts in vocational education management, such as Ding Xiaxia, Xia Yuanyuan and Wu Dandan [2; 4; 14] have discussed certain issues related to integrating information technology in vocational education teaching in their articles, they have not fully embraced a development mindset that aligns with the principles of reforming vocational education through information technology. Moreover, Li Lei, Zeng Yingwei have not provided specific measures to ensure the quality of teaching in key aspects of information technology integration, nor have they offered guidance for effectively managing the quality of vocational education teaching [5; 8]. As a result, Si Wenjun and Liu Chuang are unable to accurately identify the underlying causes of existing problems and propose effective strategies to enhance the implementation of information technology in vocational education [10–11].

**Formulation of the goals of the article (statement of the task)** to conduct innovative research on the evaluation methods of the faculty building capacity of Chinese vocational education institutions, in order to promote the improvement of the faculty building capacity of Chinese vocational education institutions. This article selects theories related to the construction of teaching staff in Chinese vocational education institutions as the basis, and conducts research through literature review, in-depth interviews, and case analysis evaluation methods to ensure the scientific and effective results of this study.

**Highlighting previously unresolved parts of the overall problem.** Currently, among countries around the world, countries with more mature vocational education development are mainly focusing on the research of teacher training models, methods, and systems in the construction of teacher teams in vocational education institutions. The management of

teachers mainly includes incentive mechanisms, teacher promotion, and teacher guarantee mechanisms.

In recent years, research on the teaching staff of vocational education institutions in China has mainly focused on enhancing and improving the teaching staff, constructing evaluation systems, and other aspects, in order to promote the construction and development of the teaching staff of vocational education institutions.

In the research results of scholars from various countries on the construction of the teaching staff in vocational education institutions, most of the focus is on how to reform the teacher title evaluation system, improve the quality of the teaching staff, and build a "double qualified" teaching staff. Moreover, these studies often use qualitative analysis methods to propose corresponding improvement strategies and suggestions. By analyzing the current research status and achievements, this article adopts the AHP fuzzy comprehensive evaluation method, combined with the current situation of vocational education in China, to attempt to construct an evaluation index system for the construction of teaching staff in vocational education institutions.

#### **Presentation of the main research material.**

The research on the construction of teaching staff is currently a hot topic in the management of vocational education both domestically and internationally. Improving the quality of teaching staff is a key breakthrough in improving the quality of education. In 2020, six departments including the Ministry of Education of China issued the Guiding Opinions on Strengthening the Construction and Reform of the Teaching Staff in Higher Education Institutions in the New Era. The Central Committee of the Communist Party of China and the State Council issued documents such as the Overall Plan for Deepening the Reform of Education Evaluation in the New Era, which put forward higher requirements for the construction and evaluation of the teaching staff [3]. Currently, countries around the world, especially developed countries, attach great importance to the construction of teaching staff, which has become a key field of research in the academic community at home and abroad.

In the construction and development process of vocational education institutions, the construction of teaching staff has become an important part of the connotation development of vocational education. The construction of teaching staff is a key factor in improving the teaching quality level of vocational education institutions [4]. However,

in many vocational education institutions, there is a lack of evaluation plans for the level of teaching staff construction. That is to say, although vocational education institutions focus on the construction of teaching staff, the effectiveness and degree of this team construction lack a truly scientific and reasonable system to regulate. Many vocational education institutions only emphasize academic qualifications and majors in the process of building their teaching staff, without fully considering the construction and development of the teaching staff from the key indicators of skilled talent cultivation, thus affecting the quality of teaching staff construction [16]. Therefore, it is necessary to establish a scientific and reasonable evaluation system for the level of teacher team construction, identify the main factors that affect the quality of teacher team construction, and only in this way can we avoid deviations in the process of teacher team construction and ensure the effectiveness of teacher team construction [6].

There are two important aspects in the process of comprehensive evaluation of the construction of the teaching staff: one is the design of the evaluation index system, and the other is the determination of the functional relationship between each index and the evaluation subject. At present, comprehensive evaluation methods mainly include analytic hierarchy process, fuzzy comprehensive evaluation, artificial neural network evaluation, gray comprehensive evaluation, Data envelopment analysis and Delphi method. After research and comparison, on the basis of fuzzy theory (proposed by American professor LA. Zadeh in 1965), we use fuzzy mathematics principles to quantify fuzzy factors, and use fuzzy mathematics methods to comprehensively evaluate the construction of the teaching staff, in order to scientifically draw evaluation conclusions. This method combines fuzzy mathematics with Analytic Hierarchy Process (AHP), making the evaluation indicators both qualitative and quantitative. It is a very ideal and effective multi factor decision-making method.

The indicator system refers to a whole composed of a series of indicators, which can comprehensively and truly reflect the various aspects of the research object. The establishment of an evaluation index system for the construction of teaching staff in vocational education institutions should follow the principles of scientificity, comprehensiveness, systematicity, comparability, feasibility, and importance [7].

The construction of the teaching staff in vocational education institutions is a complex system with multiple factors and levels, which requires the use of a combination of qualitative and quantitative analysis to objectively evaluate the comprehensive quality of teachers. We will layer the entire system of teaching staff, each layer consisting of several evaluation factors, and evaluate the construction of teaching staff in vocational colleges by quantitatively processing the evaluation factors. In order to ensure the reliability and scientificity of the evaluation system for the construction of teaching staff in vocational colleges, it is necessary to conduct in-depth theoretical exploration and analysis of the selection of evaluation indicators [8].

By analyzing the content that must be evaluated in the construction of teaching staff in vocational education institutions, we found that the stakeholders involved include employers, vocational colleges themselves, students on campus, and teachers. Diversified stakeholders inevitably require us to evaluate the construction of teaching staff in vocational education institutions from multiple perspectives, and carefully consider the selection of evaluation indicators [9].

In order to ensure the integrity and scientificity of the indicator system construction, this article conducted on-site investigations and research on several vocational education institutions. Through relevant interviews with leaders, teachers, students, and others of vocational education institutions, combined with professional

and authoritative experts for consultation, detailed information on the construction of the teaching staff in vocational education institutions was collected, and indicators were scientifically and reasonably screened, Enable it to comprehensively and effectively evaluate the level of teaching staff construction [10]. By reviewing the relevant research and theoretical achievements of Chinese vocational education experts and scholars (see Table 1), it was found that the construction of the teaching staff mainly focuses on two aspects: the structure of teachers and the "double qualified" teachers. Therefore, it is regarded as a primary indicator for the construction of the teaching staff. Combined with on-site investigations and visits to vocational education institutions, two primary indicators, namely the teacher assessment system and professional construction and teaching reform, have been added. In terms of secondary indicators, the research mainly focuses on the results of evaluation indicators for teacher team construction by Chinese vocational education experts in Table 1.

Knowledge structure optimization status indicators are added to the secondary indicators for "teacher structure optimization", and innovative settings are made for the secondary indicators for "professional construction and teaching reform". Other indicators mainly come from the secondary indicators in literature research in Table 1 [11]. Based on the above research, the performance evaluation index system for the construction of teaching staff

Table 1

**Summary of evaluation indicators of teacher team building of Chinese scholars**

Expert Name	Research field	Indicator selection
Zhao Jinzhou	Higher Vocation Education	Student teacher ratio, dual teacher structure, age structure of full-time teachers, quality structure of full-time teachers, teaching hours of part-time teachers, quality and ability of part-time teachers, and teaching ability training
Du Guojiang	Higher Vocation Education	Professional ethics, teaching work, scientific research, professional ability, practical ability
Liu Junjie	Private vocational education	Teaching status, research ability, student development, subject construction, and management
Li Jia	Vocational	Optimization of teacher structure, talent growth environment, incentive mechanism, and teacher professional ability, double qualified teachers, improvement of teacher assessment system, satisfaction of stakeholders in teacher construction
Wang Xuli	Vocational	Teaching conditions, professional construction and teaching reform, teacher demeanor, teacher treatment
Li Kuilong	Higher Vocation Education	Teaching positioning, goals and measures for teacher team construction, student teacher ratio, and teacher structure

in vocational education institutions was finally determined, as shown in Table 2. Among them, the evaluation indicators for the construction of teaching staff in vocational education institutions include four dimensions: the optimization of teacher structure, teacher assessment system, dual teacher, professional construction and teaching reform, totaling 15 tertiary indicators.

The meanings of each indicator in Table 2 are as follows the indicators included in the "Optimization of the structure of the teaching staff" section are mainly used to evaluate the optimization level of teacher structure, including four indicators: age structure, educational structure, professional title structure, and knowledge structure. Among them, age structure refers to whether the age of teachers in the institution has reached a reasonable proportion of elderly, middle-aged, and young after evaluation of the construction of the teaching staff, that is, whether the age structure has been optimized.

Academic structure refers to the evaluation of the teaching staff construction of vocational education institutions at different levels of cultivation, and whether the proportion of undergraduate, master's, and doctoral degrees of the institution's teachers is reasonable, that is, whether the academic structure has been optimized. The structure of professional titles refers to whether, after evaluation of

the construction of the teaching staff, the professional titles of the institution's teachers have reached a reasonable proportion of low-level, intermediate, and high-level professional titles, that is, whether the structure of professional titles has been optimized. Knowledge structure refers to whether the knowledge structure of the institution's teachers has reached a reasonable and complementary state after evaluation of the construction of the teaching staff, that is, whether the knowledge structure has been optimized.

The indicators included in the "Teacher Assessment System" section are mainly used to evaluate the achievements made in the teacher assessment system, including four indicators: the scientific nature of the teacher assessment system, the fairness of the teacher assessment system, the completeness of the teacher assessment system, and the humanization of the teacher assessment system. Among them, the scientific nature of the teacher assessment system refers to whether the teacher assessment system is scientific and reasonable. The fairness of the teacher assessment system refers to whether it treats all assessed individuals equally. The completeness of the teacher assessment system refers to whether the system is comprehensive and effective. The humanization of the teacher assessment system refers to

Table 2

**Evaluation index system for the construction of teaching staff  
in vocational education institutions**

Primary indicators	Secondary indicators	Third level indicators
Evaluation index system for the construction of teaching staff	Optimization of the structure of the teaching staff	Optimization of age structure
		Optimization of educational structure
		Optimization status of professional title structure
		Optimization of knowledge structure
	Teacher assessment system	The scientific nature of the teacher assessment system
		Fairness of Teacher Assessment System
		The Perfection of the Teacher Assessment System
		Humanization of Teacher Assessment System
	Dual teacher teacher competency characteristics	Teaching work status
		Scientific research status
		Practical ability status
		Teacher's ethics and style
	Professional construction and teaching reform	Reform of talent training programs
		Reform of teaching methods and content
		Curriculum system reform

whether the teacher assessment system is accepted by the majority of teachers.

The indicators included in the "Dual Teacher Teacher Competency Characteristics" section are mainly used to evaluate the effectiveness of teacher team construction in the construction of 'Dual Teacher' teachers, including four indicators: teaching work status, scientific research status, practical ability status, and teacher ethics and style status. Among them, the teaching work status mainly includes: number of classes, class hours, number of guiding students, number of teaching projects, number of teaching achievement awards, evaluation effect of reform, and application effect. The scientific research status mainly includes: project level and funding number, academic paper level and number, publication status of monographs, patent application status, national level awards, and provincial and ministerial level awards lazy status. The practical ability mainly includes: awareness of one's own position, frequency and level of participating in vocational training, time and experience in enterprise employment, as well as organizational, coordination, and management abilities in practical teaching. The status of teacher ethics and professional conduct mainly includes adherence to academic ethics standards, professional ethics and spirit, and teaching attitude.

"Professional construction and teaching reform" mainly refer to three indicators: talent training program reform, teaching methods and content reform, and curriculum system reform. Among them, the reform of talent cultivation

plans mainly manifests in the training objectives and professional positioning, the reflection of "three innovations" (innovation, creation, entrepreneurship) education, and the reflection of quality education. The reform of teaching methods and content mainly manifests in improving students' innovation ability, heuristic teaching, participatory teaching, and cultivating students' thinking patterns. Meanwhile, the reform of teaching content includes two aspects: theoretical teaching content reform and time teaching reform. The reform of the curriculum system mainly refers to the innovative concept of the curriculum system, the richness of the curriculum content, the operability, flexibility, and practicality of the curriculum system.

**Conclusions.** With the increasing emphasis of the country on vocational education issues, the scale of vocational education institutions in China is becoming larger and larger. However, many problems have also emerged during its development process, the most critical of which is the construction of the teaching staff in vocational education institutions. The effectiveness of teaching staff construction directly affects the quality of vocational education. On the basis of following the principle of indicator construction, it is crucial to develop a scientific, reasonable, comprehensive, and systematic evaluation index system for the teaching staff. For China's vocational education in the exploratory stage, it is crucial to build a teaching staff that can meet the development needs of various levels and types of vocational education institutions.

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