MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY NATIONAL AGRARIAN UNIVERSITY

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UDC: 331:005.95

DISSERTATION

INNOVATIVE SYSTEM FOR PERSONNEL MANAGEMENT IN CHINESE VOCATIONAL EDUCATION INSTITUTIONS

Speciality 073 - Management

(Field of study 07 – Management and administration)

Submitted for a scientific degree of Doctor of philosophy

The dissertation contains the results of own research. The use of ideas, results and texts of other authors have references to the relevant source

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Sumy 2023

ABSTRACT

Zhao Hejun. Innovative system for personnel management in Chinese vocational education institutions. - Qualifying scientific work on manuscript rights.

Dissertation for obtaining the scientific degree of Doctor of Philosophy in specialty 073 - Management. – Sumy National Agrarian University, Sumy, 2023.

The dissertation examines the theoretical, methodological, and practical aspects of the innovative personnel management system in Chinese vocational education institutions.

The continuous development of China's economy, industrial modernization and economic restructuring are accelerating the demand for technical and skilled personnel in all spheres of life, thereby positioning the prominent role of vocational education. Faced with the new economic situation and demand in the human resources market, vocational education needs constant reform and innovation to enhance high-quality development. In 2022, China's total GDP reached 18,100 billion US dollars, accounting for approximately 18% of the world economy and continuing to hold its second place in the world, so the significant role of vocational education in promoting the country's economic development is obvious.

Among the common problems in the personnel management system of vocational education in China that need to be solved is to change the form of organization of vocational education institutions which is completely uniform, introduced by the government, and affects the autonomy in matters of employment. Personnel management corresponds to the management philosophy of "putting things first", is subject to external influence and has low transparency. The composition of the personnel potential of most vocational and technical educational institutions is not completely rational, there is a shortage of teaching and research staff, while a large staff is created by auxiliary workers, which to some extent slows down the development of educational and research work of institutions and generally complicates their fundamental development.

The theoretical part of the dissertation work systematizes the theoretical

foundations, deepens the concepts, and forms a methodological approach to ensuring the management of personnel in vocational-technical educational institutions in China by addressing common problems regarding a unified organizational form of institutions. This will contribute to the better development of Chinese vocational education in market conditions and the growth of the social economy through the implementation of an innovative functioning system for institutions. In the future, this will enable vocational education institutions to enhance the integration of production and education based on changes in market conditions through continuous targeted reforms to meet the needs of the market. This will gradually create a professional-qualification and standard system that is results-oriented, meets market demand, corresponds to academic qualifications, reflects the attributes of technical and skilled talents, and has high social recognition and economic adaptability, including a multi-level and multi-dimensional development model.

Based on the study of the innovative experience and practices of foreign personnel management policy systems, the research summarizes that the construction of the innovative personnel management system in vocational education institutions in China should be adapted to local conditions in order to strengthen the structure of the organizational system, smooth the channels of personnel outflow, and continuously innovate in the training of scientific and pedagogical staff, effectively change existing management models with the help of innovative methods of stimulation, maximize the value of talents and help professional education institutions in sustainable development.

During the research, a system of indices was proposed and a selection of evaluation indicators was carried out (optimization of the structure of teachers, a system of teacher evaluation, a dual model of teachers, professional construction and reform of teaching), design of a system of evaluation indicators, determination of the functional relationship between each indicator and the subject of evaluation for the implementation of qualitative and quantitative analysis of the objective assessment of the comprehensive quality of teachers, the formation of teaching staff in vocational colleges from different points of view, starting from the various needs of stakeholders

through interviews with employers, vocational education institutions, applicants and teachers. The hierarchical structure model itself is based on an analytical hierarchical process, and the calculation method itself is for assigning weight to indicators at all levels, providing innovative proposals for scientific and accurate assessment of the level of construction of teaching staff in vocational education institutions.

It has been found that the leaders of vocational education institutions are experts responsible for managing the work processes of the entire institution, and their qualifications in performing their duties directly impact the development and future of these institutions. Therefore, to strengthen the competence of leaders of vocational education institutions in China, a competence model for leaders of vocational-technical training institutions has been proposed through empirical data with the involvement of education professionals, managers, and teachers. It has been established that competence, as an inevitable result of the improvement of work distribution, should be a combination of complex skills and qualities of leaders of vocational education institutions. This competence model for managers measures the structure of planning, decision-making, risk assessment, cultural education, and the formation of core competitiveness, which can accurately describe the objective level of managerial competence.

Using the methods of questionnaires and sample research, a survey was conducted on the competence of managers of Chinese vocational education institutions, which covered the full range of subjects in terms of age, level of education, structure of professional titles, types of institutions and positions to check the parameters: analytical and inductive abilities (MC1), decision-making and planning skills (MC2), communication and organizational skills (MC3), leadership and demonstration skills (MC4), assessment skills and charisma (MC5), core competitiveness (MC6) and three aspects: professional understanding and identification, professional knowledge and methods, professional skills and behavior. Cronbach's alpha coefficient ranged from 0.970 to 0.987 and showed high reliability, stability and reliability of the data and carried out an analysis of validity factors based on the collected data and the results of the analysis reflected the real situation in various dimensions and were further

developed as a model of the structure of competences of heads of vocational education institutions through a questionnaire of administrative personnel for six different levels with an analysis of the current situation of the existing management and proposed solutions to the existing problems, which contributed to the further development of vocational education in an empirical study.

The thesis proposes that the interactive development of vocational education and the economy in China adhere to the principles of people-oriented development, balancing public welfare and economic interest, integrating localization and internationalization, clarifying rights and responsibilities, and diversified systems of restraints and counterweights In addition, it proposes innovative improvements in the level of shared governance between multiple actors, adhere to government guidelines for vocational education management, increase the effectiveness of the leadership of industry organizations and promote the full role of business actors. The guiding principles are aimed at strengthening the independent executive capacity of vocational colleges.

Based on the requirements for building a modern information-oriented personnel management model for vocational education institutions, the general architecture of a modern information-oriented personnel management system for vocational education institutions is proposed, as well as the main points and requirements for the relevant systems. It explores solutions to achieve the informatization of the personnel management system, which has strong relevance and guidance for the implementation of the innovative personnel management system in Chinese vocational education institutions.

The research substantiates the determination of the directions of the personnel management strategy of vocational education institutions based on modern information technologies, which is the basis for building a more perfect and effective personnel management system of vocational education to eliminate the identified shortcomings of the current information system of personnel management in vocational education institutions of China through a systematic analysis feasibility, functionality and management processes using an integrated JAVAEE technology development

environment, Servlet, SSH framework, SQL SERVER database.

Keywords: management, personnel management, personnel development, innovative development, professional development, educational services market, international activity, educational institutions, university, education, innovation resistance, innovative system, education and training quality.

АНОТАЦІЯ

Чжао Хецзюнь. Інноваційна система управління персоналом у китайських закладах професійної освіти. – Рукопис.

Дисертація на здобуття наукового ступеня доктора філософії за спеціальністю 073 – Менеджмент. – Сумський національний аграрний університет, Суми, 2023.

У дисертації обґрунтовано теоретико-методологічні та науково-практичні аспекти щодо інноваційної системи управління персоналом у китайських закладах професійної освіти.

Постійний розвиток економіки Китаю, промислова модернізація та економічна реструктуризація прискорюють попит на технічний та кваліфікований персонал у всіх сферах життя тим самим позиціонуючи помітну роль професійно-технічної освіти. Зіткнувшись з новою економічною ситуацією та попитом на ринку людських ресурсів, професійно-технічна освіта потребує постійного впровадження реформ та інновацій для посилення високоякісного розвитку. У 2022 році загальний ВВП Китаю досяг 18100 мільярдів доларів США, що становить приблизно 18% світової економіки та продовжує утримувати своє друге місце у світі, тому значна роль професійно-технічної освіти в сприянні економічному розвитку країни є очевидною.

Серед поширених проблем у системі кадрового управління професійно-технічної освіти в Китаї, які потрібно вирішити це змінити форму організації професійно-технічних навчальних закладів яка є повністю однотипною, запроваджується урядом, та впливає на автономію у питаннях

працевлаштування. Кадрове управління відповідає філософії менеджменту «ставити речі на перше місце», піддається зовнішньому впливу та має низьку прозорість. Склад кадрового потенціалу більшості професійно-технічних навчальних закладів не є повністю раціональним, відбувається нестача викладацького та науково-дослідницького персоналу, тоді як великий штат створюють допоміжні працівники, що до певної міри гальмує розвиток навчально-дослідної роботи закладів і загалом ускладнює їх фундаментальний розвиток.

В теоретичній частині дисертаційної роботи систематизовано теоретичні основи, поглиблено поняття та сформовано методологічний підхід забезпечення управління персоналом професійно-технічних навчальних закладів Китаю через вирішення загальних проблем відносно єдиної форми організації закладів, що сприятиме кращому розвитку китайської професійної освіти в ринкових умовах та зростанню соціальної економіки через впровадження інноваційної системи функціонування закладів. Це сприятиме в майбутньому закладами професійної освіти посилювати інтеграцію виробництва та освіти на основі змін ринкової кон'юнктури, шляхом постійних цілеспрямованих реформ для відповідності професійно-технічної освіти до потреб ринку. Поступово створюючи професійну-кваліфікаційну та стандартну систему, яка орієнтована на результати навчання, задовольнятиме ринковий попит, відповідатиме академічним кваліфікаціям, відображатиме атрибути зростання технічних і кваліфікованих талантів і має високе соціальне визнання та економічну адаптивність включаючи багаторівневу та багатовимірну модель розвитку.

На основі вивчення інноваційного досвіду та практик зарубіжних систем кадрової політики управління персоналом, дослідження резюмує, що побудова інноваційної системи управління персоналом у закладах професійної освіти в Китаї має бути пристосована до місцевих умов, щоб посилити структуру організаційної системи, згладити канали відтоку кадрів, постійно впроваджувати інновації в навчання науково-педагогічного персоналу, ефективно змінювати існуючі моделі управління за допомогою інноваційних методів стимулювання,

максимізувати цінність талантів і допомогти закладам професійної освіти у стабільному розвитку.

В ході дослідження запропоновано систему індексів та здійснено вибір індикаторів оцінювання (оптимізацію структури викладачів, систему оцінювання викладачів, дуальну модель викладачів, професійну конструкцію та реформування викладання), проектування системи показників оцінювання, визначення функціонального зв'язку між кожним показником і предметом оцінювання для здійснення якісного та кількісного аналізу об'єктивної оцінки комплексної якості викладачів, формування викладацького складу в професійних коледжах з різних точок зору, починаючи з різноманітних потреб зацікавлених сторін через інтерв'ю з роботодавцями, закладами професійної освіти, здобувачами та викладачами. Сама модель ієрархічної структури, заснована на аналітичному ієрархічному процесі, а сам метод розрахунку для присвоєння ваги показникам на всіх рівнях, надаючи інноваційні пропозиції для наукового та точного оцінювання рівня побудови педагогічного персоналу в закладах професійної освіти.

Виявлено, що керівники закладів професійної освіти є фахівцями, відповідальними за управління робочими процесами всього закладу, а їх кваліфікація у виконанні своїх обов'язків на посадах безпосередньо впливає на розвиток і майбутнє закладів професійної освіти, тому для посилення компетентності керівників закладів професійної освіти Китаю, запропоновано модель компетентності керівників професійно-технічних навчальних закладів шляхом емпіричних даних з експертами професійної освіти, менеджерами та викладачами. Доведено, що компетентність, як неминучий результат удосконалення розподілу праці, має бути сукупністю комплексних умінь і якостей керівників закладів професійної освіти. Ця модель компетенцій менеджерів вимірює структуру планування, прийняття основних рішень, оцінку ризиків, культурну освіту та формування основної конкурентоспроможності, яка може точно описати об'єктивний рівень компетенції менеджера.

За допомогою методів анкетування та вибіркового дослідження здійснено

опитування щодо компетентності керівників китайських закладів професійної освіти, що охопило повний спектр суб'єктів з точки зору віку, рівня освіти, структури професійних назв, типів закладів та посад для перевірки параметрів: аналітичні та індуктивні здібності (МС1), здатність приймати рішення та планування (МС2), комунікативні та організаційні здібності (МС3), лідерські та демонстраційні здібності (МС4), здатність до оцінки та харизми (МС5) основної конкурентоспроможності (МС6) та трьох аспектів: професійне розуміння та ідентифікація, професійні знання та методи, професійні здібності та поведінка. Коефіцієнт Альфа Кронбаха коливався від 0,970 до 0,987 і показав високу надійність, стабільність та достовірність даних та здійснив аналіз факторів валідності на основі зібраних даних а результати аналізу відобразили реальну ситуацію в різних вимірах та набули подальшого розвитку як модель структури компетенцій керівників закладів професійної освіти через анкетування адміністративного персоналу для шести різних щаблів з аналізом поточної ситуації існуючого управління та запропоновано вирішення наявних проблем що сприяло подальшому розвитку професійно-технічної освіти в емпіричному дослідженні.

У дисертації пропонується, щоб інтерактивний розвиток професійно-технічної освіти та економіки в Китаї дотримувався принципів розвитку, орієнтованого на людей, збалансування суспільного добробуту та економічного інтересу, інтеграції локалізації та інтернаціоналізації, роз'яснення прав і обов'язків, а також диверсифікованих систем стримувань і противаги. Крім того, він пропонує інноваційно покращити рівень спільного управління між кількома суб'єктами, дотримуватися урядових вказівок щодо управління професійно-технічною освітою, підвищити ефективність керівництва галузевими організаціями та сприяти повному виконанню ролі суб'єктів господарювання. Керівні принципи направлені на зміцнення незалежної виконавської здатності професійно-технічних коледжів.

Базуючись на вимогах побудови сучасної інформаційно-орієнтованої моделі управління персоналом для закладів професійної освіти, запропоновано

загальну архітектуру сучасної інформаційно-орієнтованої системи управління персоналом для закладів професійно-технічної освіти, а також основні моменти та вимоги до відповідних систем. Віна досліджує рішення для досягнення інформатизації системи управління персоналом, яка має сильну актуальність і керівництво для впровадження інноваційної системи управління персоналом у китайських закладах професійної освіти.

У дослідженні обґрунтувано визначення напрямів стратегії управління персоналом закладів професійної освіти на основі сучасних інформаційних технологій, яка є основою для побудови більш досконалої та ефективної системи управління персоналом професійно-технічної освіти для усунення виявлених недоліків поточної інформаційної системи управління персоналом у закладах професійної освіти Китаю через систематичний аналіз здійсненності, функціональності та процесів управління за допомогою інтегрованого середовища розробки технології JAVAEE, Servlet, SSH framework, бази даних SQL SERVER.

Ключові слова: менеджмент, управління персоналом, розвиток персоналу, інноваційний розвиток, професійний розвиток, ринок освітніх послуг, міжнародна діяльність, заклади освіти, університет, освіта, спротив інноваціям, інноваційна система, якість освіти та навчання.

LIST OF THE PUBLICATIONS

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Publications which additionally reflect the scientific results of the dissertation:

13. **Hejun Zhao**, Guohou Li Quality management measures of specialty construction planning of higher vocational education in china - internal diagnosis and improvement. [Monograph]. *Sustainable development of rural areas: institutional support and challenges of reform, P.75-82.* https://doi.org/10.31435/rsglobal/003 *(the author conducted the literature collation, designed the research framework, and prepared the original draft)*

CONTENT

LIST OF SYMBOLS

AHP	-	Analytic Hierarchy Process
BTEC	-	Business & Technology Education Council
CPC	-	the Communist Party of China
E-R	-	Entity Relationship
GDP	-	Gross Domestic Product
IHK	-	Industrie- und Handelskammer
IMF	-	International Monetary Fund
JSP	-	Java Server Pages
MHRSS	-	Ministry of Human Resources and Social Security
OECD	-	Organisation for Economic Co-operation and Development
SQL	-	Structured Query Language
SSH	-	SpringMVC, Spring, Hibernate
TAFE	-	Technical And Further Education
UNESCO	-	United Nations Educational, Scientific, and Cultural Organization
WEB	-	World Wide Web
WEF	-	World Economic Forum
XML	-	eXtensible Markup Language

INTRODUCTION

Relevance of the topic. Since the reform and opening up, China has only used 44 years, with its GDP soaring from 364.5 billion yuan in 1978 to 121020.7 billion yuan in 2022, a full 332 fold increase. In the great practice process of China's economic cooperation with other countries in the world and the extensive use of the world's advanced technology and advanced equipment to strive for economic development, vocational education has become a decisive factor in the basic guarantee of social and economic progress and development. Statistical data shows that in 1978, the number of vocational education students in China was only 880000, but in 2022, this number rapidly increased to 16.23 million. It can be said that the tremendous achievements of vocational education in the fields of professional talent cultivation and reserve, employee technical skills improvement and re education, and improving the industrial development chain have played an important role in China's economic construction, It has greatly promoted the progress and evolution of China from a traditional agricultural power to a manufacturing and powerful country. This process has closely integrated Chinese vocational education with the development of the Chinese economy, further forming a virtuous cycle of interactive development between vocational education and the economy.

Currently, with the further development of the Chinese economy and the continuous improvement of industrial form, Chinese vocational education has ushered in a new era of rapid development and innovative reform. Faced with numerous development opportunities, Chinese vocational education has also put forward more and higher requirements. In 2022, the newly revised Vocational Education Law of the China for the first time established the equal importance of vocational education and general education in legal form, and clearly stipulated that the state should take measures to improve the social status and treatment of technical and skilled personnel, promote the glory of labor, valuable skills, and create great fashion of the times.

In the face of vocational education reform, it is imperative to enhance the personnel management ability and level of Chinese vocational education institutions.

The personnel management of vocational education institutions involves a series of core functions such as faculty management, performance evaluation, salary management, and employee appointment. It is the basic guarantee condition for vocational education institutions to achieve their educational role and goals, a key indicator to reflect the core competitiveness of a vocational education institution, and a main driving force to unleash the work enthusiasm, initiative, and creativity of all employees. It can be said that the level of personnel management determines the overall strength of a vocational education institution and is an important guarantee for its development.

The literature review was based on research results from developed countries abroad and Chinese scientists. These Chinese and foreign scientists include Al Mamun C., Hasan M., Chen X., Ding X., Doner R., Frey A., Ruppert J., Harrison R., Koshkalda I., Li Y., Lin X., Meng L., Mubanga P., Qiu L., Raymond A., Samilo A., Shao T., Sun A., Torey J., Xia X., Yang X., Zhang A. Their research is mainly focused on personnel management in vocational education institutions. However, in these studies, there is relatively little research on the development trend of personnel management in Chinese vocational education institutions, the competence of vocational education institution managers, and the modern informatization of personnel management systems in vocational education institutions. Therefore, this article chooses to study the system innovation of personnel management in Chinese vocational education institutions, providing reference and strategies for innovative personnel management systems in Chinese vocational education institutions.

Connection of work with scientific programs, plans, and topics. The dissertation was carried out in accordance with the directions of research work of the Department of Management of the Sumy National Agrarian University: "Development of management in the context of international integration processes" 2019-2023 (state registration number 0119U001336), on this basis and background, the author investigated the problems and main trends in personnel management in Chinese vocational education institutions, and evaluated the experience of personnel management in foreign vocational education institutions.

The purpose of the work is to develop practical suggestions for the innovation of personnel management system in vocational education institutions through in-depth analysis and research on the theory and current situation of personnel management in vocational education institutions.

The Aim and Objectives of the study.

- Exploring the overall direction and characteristics of the development of vocational education institutions under market conditions;
- Summarizing the experience of foreign vocational education;
- Summarize the current situation and development trend of personnel management in vocational education institutions in China;
- Innovative methods for analyzing human resource management in vocational education institutions;
- Summarize the strategic methods of vocational education institutions in China to adapt to economic development;
- Propose strategies for enhancing the competence of managers in Chinese vocational education institutions;
- Propose innovative personnel management system strategies for vocational education institutions in China.

The object of the study is the personnel management process of Chinese vocational education institutions.

The subject of this study is the current situation, theory, practice, and innovation of the personnel management system in vocational education institutions under modern market conditions.

The applicant's personal contribution. The dissertation is a completely independent scientific work. All research results presented in this article were personally received by the author and submitted for defense.

Research methods. According to the purpose of this Thesis, based on the personnel management of Chinese vocational education institutions, this research systematically analyzes the significance of improving personnel management to improve the level of Chinese vocational education, analyzes the system and experience

of Chinese and foreign vocational education through literature analysis and comparative analysis, and qualitatively analyzes the current situation of the personnel management system of Chinese and foreign vocational education institutions, Thus, we can learn from advanced foreign vocational education concepts and innovative experience in personnel management. We applied the Analytic Hierarchy Process to construct a hierarchical structure model and assign weights to indicators at all levels of teacher team construction. Through questionnaires, interviews, comprehensive analysis and other methods, this paper analyzes and summarizes the problems faced by the personnel Kwalliso of Chinese vocational education institutions, and provides suggestions and strategies for innovative personnel management.

The information foundation of the study was based on official information and data disclosure channels from the Chinese government. There are mainly official online platforms such as the National Bureau of Statistics, the Ministry of Education, and the Ministry of Human Resources and Social Security of China, as well as some official vocational education websites, databases, and official websites of vocational education institutions.

Scientific novelty of the obtained results. The scientific novelty of the research results proposed in this study is a deepening of the personnel management theory of Chinese vocational education institutions, and proposes scientific, reasonable, and practical strategies and suggestions for the innovation of the personnel management system of Chinese vocational education institutions. This scientific achievement is real, and its main presentation of scientific novelty is as follows:

First obtained:

- This dissertation develops a structural model of the competency of managers in vocational education institutions, in order to achieve more targeted innovative management of vocational education institutions. This model analyzes 17 aspects of competency and forms a hierarchy of 6 different dimensions of competency. Unlike existing models, this model not only defines basic capabilities, but also defines excellent management capabilities for high-level management capabilities that can achieve sustainable development of vocational education, in order to achieve higher

quality operation and development of vocational education institutions.

- Based on the hierarchical structure model of analytic hierarchy process, the scientific index weight is determined through the calculation of the comparative judgment matrix and the consistency test of the hierarchical sequence, and the evaluation method of the construction level of teachers in vocational education institutions is innovated.

- Based on the theoretical concepts and methodology of development, this dissertation innovates the personnel management strategies of Chinese vocational education institutions from the perspective of promoting high-speed, healthy, and sustainable development of China's national economy, in order to promote China's strategic realization of promoting economic and industrial development and maintaining economic growth through vocational education.

Improved:

- Based on the competency structure model of vocational education institution managers, a competency survey questionnaire for vocational education institution managers was developed for six different dimensions. The questionnaire analyzed the current situation of vocational education management in China, proposed improvement strategies for existing problems, and promoted the further development of vocational education.

- Improve the strategy of personnel management innovation system in vocational education institutions, implement classified policies based on the differences in industrial characteristics, economic structure, and regional characteristics in different regions, and innovate current economic development strategies.

Further developed:

- Summarized and analyzed the management concepts, imbalance in human resource ratio, and lack of innovation among the current management personnel of vocational education institutions. Based on the development trend of vocational education, countermeasures were proposed to improve the abilities and qualities of vocational education management personnel at three levels: national policies, management departments, and self-improvement.

- In response to the shortcomings of the current personnel management information system in vocational education institutions in China, a systematic analysis was conducted on feasibility, functionality, and management processes with the support of JAVAEE technology, Servlet, SSH framework, SQL SERVER database, and development environment. A new concept of personnel management in vocational education institutions based on modern information technology was proposed, providing a basis for building a more advanced and efficient vocational education personnel management system.

The innovation of the personnel management system in Chinese vocational education institutions will be conducive to breaking through the limitations of slow economic growth, enhancing the driving effect of vocational education on economic and social development, and bringing strong innovation drivers to the development of the Chinese economy. It is a useful reference and suggestion for promoting further improvement of the Chinese economy.

The scientific and practical significance of this dissertation lies in the fact that the personnel management of vocational education institutions must keep up with the times and constantly innovate management concepts and methods to adapt to the constantly changing social and economic environment needs. By innovating personnel management, continuously optimizing the construction of talent teams, providing strong talent support for the sustainable development of vocational education institutions, it has important reference value and promoting role in promoting the continuous improvement of management level in Chinese vocational education institutions.

Personal contribution of the acquirer. The research work of the dissertation was independently completed by the author. Scientific results, conclusions, and proposals submitted for defense were received by the author personally.

Approbation of the results of the dissertation. The main terms and results of the paper research are disclosed by the author at conferences and seminars, among which the most important are the International Scientific Conference ERAZ 2020, the 6th International Scientific Conference on Knowledge based Sustainable Development

(May 21, 2020, Belgrade), the International Student Day All Ukrainian Students and Postgraduates Scientific Conference (November 14, 2022, Sumy), Sustainable Development in Wartime Ukraine and the World: Multidisciplinary Conference for Young Researchers (November 25, 2022, Prague), VII International Scientific Practical Conference «Modern Management: Trends, Problems and Prospects for Development» (April 14, 2021, Dnipro), XIX International Scientific Conference «Problems of Management of Enterprises in Modern Conditions» (April 18, 2023, Kyiv).

Publication of obtained results. The main scientific achievements, main scientific propositions and conclusions of the author's theoretical and experimental research have been fully covered in 13 scientific works, 8 of which have been published in Ukrainian and other international professional journals and scientific works, 2 of which have been indexed by Scopus, and 5 scientific conference reports have been published.

Scope and structure of the dissertation. The work consists of an introduction, three sections, conclusions, and suggestions laid out on 210 pages of the main text, including 46 figures, and 15 tables. The list of used literary sources contains 164 items on 18 pages.

SECTION 1
THEORETICAL AND METHODOLOGICAL APPROACHES TO PERSONNEL MANAGEMENT IN MODERN VOCATIONAL EDUCATION OF CHINA

1.1 The general direction and characteristics of the development of vocational education institutions in market conditions

Vocational education institutions, as carriers and implementers of vocational education, play a decisive role in the quality and efficiency of cultivating high-quality technical and skilled talents in vocational education. They are receiving increasing attention globally and are constantly undergoing reform and development. In the past year, UNESCO, the European Commission, the OECD, the World Economic Forum and other global and regional organizations have issued reports urging attention to vocational education. Countries around the world have increased their support and investment in vocational education, promoted digital technology, enhanced international cooperation, reformed certification systems, and strengthened sustainable development, promoting the progress and development of vocational education institutions in cultivating more excellent technical and skilled talents.

Currently, global economic and educational development is facing unprecedented challenges, and social development needs are constantly changing. Therefore, pursuing the development of the connotation of vocational education should be the main task of vocational education institutions for a considerable period of time in the future. Due to the different levels of productivity development in various regions around the world, the economic structure and labor market demand in different regions are also different. Vocational education institutions also develop according to local conditions under different market conditions. Major industries and vocational education organizations around the world have called for vocational education and training developed by vocational education institutions to keep up with the development of the times, keep up with the forefront of technology, continuously optimize the structure of vocational education in combination with market changes, adhere to quality construction as the

center, and cultivate forward-looking and international professional and technical talents from multiple aspects for global development (Cheng, X., 2019).

Countries around the world are guided by labor market demand and promote the development of vocational education from top to bottom through economic investment and policy support, creating better conditions for improving the work ability of skilled talents. For example, the Norwegian government prioritizes funding to provide education assistance. Unemployed and laid-off individuals can receive unemployment benefits and receive various forms of education, while allocating 40 million euros to help vocational schools, significantly improving the number of students and the quality of education in vocational schools. Australia has adjusted its federal budget, explicitly mentioning the need to protect employment and improve labor skills to adapt to future jobs. By increasing apprenticeship wage subsidies to cultivate skilled workers, the apprenticeship craze has reached a new high in nearly five years. The United States Department of Education has allocated 130 billion dollars to support schools, including vocational schools, to carry out labor training. In 2022, the UK government invested £400 million in funding the construction and improvement of infrastructure in 62 continuing education schools, and created more related employment opportunities nationwide.

In order to meet the demand for skilled talents in future society and promote sustained economic growth, countries around the world have increased investment in the development of vocational education. Adequate funding guarantees can provide a better development environment for vocational education and promote the cultivation of technical and skilled talents.

To ensure the development of vocational education, countries around the world continue to introduce new laws and regulations to promote the development of vocational education, and the construction of vocational education regulations will be further improved and developed. For example, the new law on Swiss federal vocational education and training officially came into effect on August 1, 2021. The new law elevates Swiss vocational education to a higher level and stipulates that Swiss vocational education research and teacher training institutions can provide

undergraduate and master's level vocational education degrees.

In order to fully leverage the role of vocational qualification certificates in improving skills and promoting employment, countries around the world are actively improving the certification mechanism for vocational education achievements, encouraging vocational college students and various in-service personnel to obtain vocational qualification certificates through vocational skills education, in order to better match the technical skills needs of the workplace. China also attaches great importance to the vocational qualification certificate system. After different periods of study, learners can obtain certificates at different levels (see Table 1.1), paving the way for their smooth employment. In 2021, the OECD Higher Education Policy Group issued an education policy document calling on governments to strengthen their emphasis and intervention on "micro certificates", support unemployed people in re employment, and pave the way for entry into higher education.

Table 1.1- Chinese vocational and technical level and training duration

Professional qualification level		Primary	Intermediate	Senior	Preparatory technician
Learning duration	Starting point of junior high school	1 year	3 years	4~5 years	Over 5 years
	Starting point of high school	0.5 years	2 years	3 years	4 years

Source: Prepared by the author

Many countries around the world are carrying out green transformation to promote the transformation and upgrading of the economy, energy, and industrial structure, in order to achieve sustainable economic and social development. The national industrial policies have important guiding significance for the teaching philosophy of vocational education institutions, and are important indicators for the high-quality development of vocational education. The development of green vocational education has become an inevitable requirement for various countries and international organizations to promote green economic and social development.

With the rapid development of science and technology and the rapid change of market demand, knowledge updating is accelerating, which requires workers to continue Lifelong learning in their career. Therefore, the demand for vocational and skilled talents in the future economy and society will be changing and will inevitably be sustainable.

Narrowly speaking, vocational education refers to the educational activities implemented by vocational schools with the goal of cultivating professional and technical talents, belonging to the category of academic education; Vocational training refers to a series of educational and training activities carried out for those who plan to be employed or are currently employed, belonging to the category of non academic education. The main target audience for teaching is adults who plan to be employed or have already been employed. Pre service vocational education in schools and post service non academic vocational training are essentially "of the same origin". The two jointly undertake the task of cultivating technical and skilled talents, are homogeneous in the pursuit of educational goals, are interconnected in curriculum design and teaching practice, and are shared in teaching resources and teacher resources. The communication, integration, and even integrated development between these two systems are in line with the common interests of both parties, which can maximize the integration of resources, improve talent cultivation efficiency, and smooth the growth channels of technical and skilled talents (Meng, L., 2018).

In response, various countries have introduced corresponding policies to support Lifelong learning and lifelong education. For example, the seminar on promoting cooperation in Japanese vocational education mentioned the idea of strengthening Lifelong learning. Workers must plan their careers from the perspective of employers and strengthen Lifelong learning. The Singaporean government has increased investment in the "Skills Future" project, launched the "Singapore Joint Work and Skills Package Plan", and collaborated with large enterprises such as Microsoft to carry out workplace training to meet the national demand for technological advancement; At the same time, "Skills Future Scholarship and Employer Award" have been established to strengthen support for skills and retraining, and to motivate

enterprises to play an important role in employee skill development and enhancement.

Currently, global education international organizations represented by UNESCO are actively exploring the transformation of vocational and technical education and training strategies to achieve a successful and just transformation, linking education with the market environment, and helping young people develop employment opportunities and acquire the skills needed for work and entrepreneurship. In 2022, the UNESCO report "The Future of Education" delved into issues such as digital technology, climate change, social polarization, and uncertain job prospects. It called for individuals and collectives to achieve educational transformation through action, leadership, stress resistance, creativity, and caring skills, and build a just, fair, and sustainable future.

The report Industry 5.0: Towards Sustainable, People oriented and Flexible European Industry released by the European Commission pointed out that education and training and skills improvement training should adapt to the Digital transformation of the industry. The European Centre for Vocational Training and Development (CEDEFOP) released a report titled "The Future of European Vocational Education and Training" in 2022, which promotes reforms in curriculum structure, content, teaching models, and other aspects of vocational education institutions to closely align with market demand through performance evaluation. The World Economic Forum (WEF) released two reports, Building a Common Language for Work Skills: Global Taxonomy and Improving Skills: Achieving Shared Prosperity, which provide new guidelines for the training and evaluation of vocational education talents.

From a global perspective, vocational education, as an important type of education, has been widely recognized by international organizations, and the world is vigorously advocating the construction of a sustainable new pattern of vocational education development. Considering the enhancement of the adaptability of skilled talents in the process of market changes or industrial upgrading, constructing a modern vocational education system that emphasizes both vocational education and training has become the key to future development, Figure 1.1 shows the structure and system of vocational education and training in China. Firstly, it is the sound development of

the school's vocational education system and vocational training system. Obviously, the current vocational training systems in many countries are not sufficient to timely and effectively respond to the needs of economic and social development and talent growth in terms of policy guarantees, qualification systems and standards construction, horizontal and vertical development channels design, and market-oriented orientation. Given the current supply and demand situation of international experience and technical skill talent cultivation, it is necessary to further clarify the policy guidance for the coordinated development of vocational education and vocational training, and to introduce specialized policies related to vocational skill training to support it, in order to carry out a deep level system construction of the vocational education system (Xie et al., 2022).

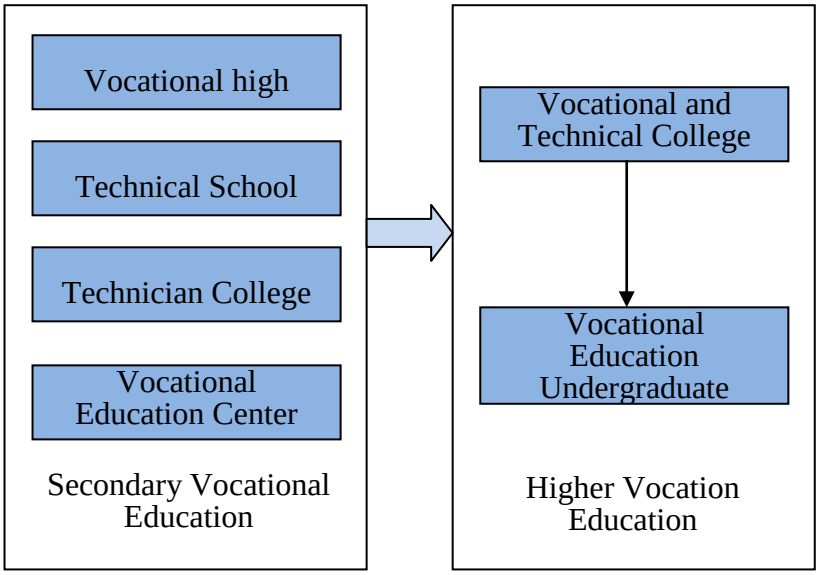

Figure 1.1- The structure and system of vocational education and training in China

Source: Prepared by the author

Referring to the development experience of Germany, the design of vocational continuing education or vocational training systems should first have a global and developmental perspective. We should not only include the training activities of technical and skilled talents in various major industries, but also coordinate and construct a vertical sequence of the system based on the laws of education and the growth of technical and skilled talents; There should be a clear system design for the

Equivalence relation and connection channels between the vocational training system and the (school) vocational education system, and between the general education system and the higher education system. The construction of a learning outcome oriented vocational qualification and standard system is the key to the development of a vocational training system. Germany, based on a clear hierarchy and clear field of vocational continuing education qualifications and standard systems, relies on the "German Qualification Framework" to standardize and guide vocational continuing education practical activities, so that technical and skilled talents in the vocational continuing education sequence have vocational qualification certificates equivalent to the value of academic qualifications, It has opened up new paths for the career growth or educational advancement of technical and skilled talents. This is the fundamental guarantee for the construction of a vocational training system and also the root cause of ensuring the attractiveness of vocational continuing education. Therefore, in the future, we should promote the construction of a vocational qualification and standard system that is guided by learning outcomes, aimed at serving market demand, required to connect academic qualifications, reflecting the growth attributes of technical and skilled talents, and highly socially recognized, as the "first step" in the construction of the vocational continuing education system.

In recent years, despite the impact of the COVID-19 pandemic, international exchanges and cooperation in the field of vocational education have remained active, and international cooperation and exchanges in various forms such as online and offline integration have not been interrupted. In the future, such exchanges will be more widely carried out, and global international cooperation in vocational education will steadily advance. For example, in 2021, the European Commission and the International Labour Organization (ILO) jointly held a high-level meeting to explore the key priorities of the new European Union of Apprentices. Many international conferences were held, such as the "the Belt and Road" International Seminar on Vocational Education sponsored by the China Association of Vocational and Technical Education, to discuss the hot issues of international cooperation in vocational education. In addition to international conferences, countries have

introduced policies to encourage international cooperation and exchange in vocational education. For example, the UK has launched a new funding application for the Turing Plan, which will receive £110 million in support. Approximately 38000 students of different age groups will have the opportunity to study, exchange, and work in over 150 countries and regions such as the United States, Japan, Canada, Thailand, and South Africa.

With the active participation and promotion of countries all over the world, the skills competition has become an important platform for technical and skilled talents from various countries to exchange and display their professional skills. Up to now, the WorldSkills Competition has been successfully held for 45 sessions. The WorldSkills Competition is known as the "World Skills Olympics", and its competitive level represents the world's advanced level of today's vocational skills development. The competition has set international standards in 47 skill categories, covering art creation and fashion, architecture and craft technology, information and communication technology, manufacturing and engineering technology, social and private services, transportation and logistics, etc. The grand meeting of achievement exchange provides vocational education institutions with a broad platform for mutual communication and learning, and promotes the continuous development of vocational education.

The process of digital and information technology reform in global vocational education will be further accelerated. Against the backdrop of the pandemic, the development of the digital economy is accelerating, and vocational education systems in various countries are fully relying on the advantages of digital education to vigorously develop digital education. The digital reform of vocational education will further promote the deep integration of technology and education, and truly achieve deep changes in education through the power of information technology. The future vocational education requires more effective response to the rapid change of information technology, and more emphasis on cultivating future oriented information thinking and comprehensive digital and information literacy. The digitization of vocational education will shift from emphasizing the introduction of technology in the

past to emphasizing deep integration and innovation, and even leading innovation. Not only will external technology introduction promote the further development of vocational education, truly transforming exogenous variables into endogenous variables, but it is also necessary to promote vocational education itself and external ecological changes on the basis of achieving internal changes in vocational education, and effectively exert the outward influence of endogenous variables.

Chinese vocational education experts believe that vocational education is not an isolated type of education, but a holistic education system. From an ecological perspective, the internal and external elements of an ecosystem should be interconnected and influenced by each other (Sun., 2019). Therefore, previously dispersed digital technology platforms or information resource systems must be re integrated under a unified standard, transforming from specialized technology platforms to integrated resource system construction.

In the future, vocational education institutions will continue to optimize the direction of talent cultivation. Firstly, it is necessary to optimize the layout of professional development and achieve homogenization through macroeconomic regulation. Through joint intervention from multiple government departments, relevant information sharing and vocational education policies can be better connected, providing policy guarantees for professional settings; Different regions should establish professional setting argumentation organizations based on their market needs, conduct argumentation and review of professional setting, propose regional professional setting plans, and reasonably control the number of professional points and enrollment scale.

Vocational colleges will dynamically adjust their professional enrollment plans to improve their adaptability to the market. On the one hand, we need to reduce the number of majors with repetitive construction, sluggish enrollment, and poor employment, and ensure that their settings are coordinated with the needs of regional industrial development; On the other hand, in terms of professional structure, professional proportion, and enrollment scale, we should adapt to the development of emerging industries and focus on arranging enrollment majors related to key industries

in the region, in order to closely integrate them with the development of the regional economy.

Vocational education institutions will further highlight their educational characteristics. Adhere to the construction principle of leading by characteristics, adopt the "selective" excellent strategy and the "clustering" construction path, adhere to the cultivation mode of industry education integration, take the integration of professional groups with the industrial chain and talent chain with the innovation chain as the fundamental guidance, take the integration of industry education as the breakthrough and important grip, and take student career development as the axis. Adhere to the leading role of scientific research innovation, improve the understanding of scientific research innovation, standardize scientific research Innovation management, and set up research projects with regional characteristics. Regional vocational education institutions will increase their support for intelligent and digital courses, and strive to form a new form of "Internet plus vocational education"; Various vocational colleges need to cultivate a team of high-level information-based teaching teachers, continuously improving the level of professional group construction and the quality of talent cultivation. By jointly building schools and enterprises and schools, we aim to create a high-quality virtual simulation training base and continuously promote the open sharing of high-quality curriculum resources, breaking down barriers to regional vocational education (Han., 2022).

Vocational education talent cultivation will continue to improve the modern vocational education system to meet the market demand for skilled talents at different levels. By constructing an integrated vocational education talent training system of "primary intermediate advanced", we aim to smooth the channels for vocational education to increase academic qualifications. At the educational level, we should accelerate the exploration of the development model of vocational education undergraduate programs and steadily promote the large-scale development of vocational education undergraduate programs; Improve the general vocational integration system, strengthen the organic connection of professional courses, scientifically plan talent training goals, cultivate highly integrated skilled talents with

professional skills and spirit, and support the development of regional key industries and pillar industries. Talent cultivation also needs to align with the future development trend of the industry, meet the future development needs of students, continuously deepen the reform of talent cultivation models, explore new models of interdisciplinary integration, and start from multiple aspects such as talent cultivation goals, departmental organizational mechanisms, supervision and inspection standards, to cultivate high-quality development, compound, and innovative technical and skilled talents that adapt to high-quality economic development; Create a new pattern of collaborative education between industry and education, establish a diverse governance entity involving government, industry, enterprises, and schools, break the boundaries between schools and enterprises, strengthen cooperation between schools and enterprises, form a borderless integrated teaching organization and research and development mechanism, and build a new pattern of reasonable division of labor and collaborative promotion, scientific positioning and distinctive development of universities.

With the development of the world economy and changes in the market, traditional teaching models require continuous reform and improvement. Based on the application of the Internet, a variety of mixed teaching modes with different teaching modes have been explored and improved more. Due to the complexity of vocational education compared to general education, the content that needs to be explored includes research on educational methods for different majors, levels, courses, and teaching environments, in order to achieve better teaching outcomes.

Firstly, through the construction of more intelligent teaching software platforms, the shortcomings of subjective evaluation based on internet teaching and intelligent evaluation of students' daily learning status will be changed, and the interactive factors of internet remote teaching will be strengthened. Due to the fact that the best process of teaching is the transfer of knowledge through two-way interaction, this reflects the best way for knowledge and skills to shift from "teacher mastery" to "student mastery". In the process of internet remote teaching, more two-way interactive mechanisms should be integrated, including the use of virtual reality technology to achieve virtual

scene teaching, which will be more conducive to enhancing the effectiveness of knowledge transfer and ensuring the effectiveness of teaching. The Practice process of mixed teaching model of vocational education based on internet can be referred to Figure 1.2.

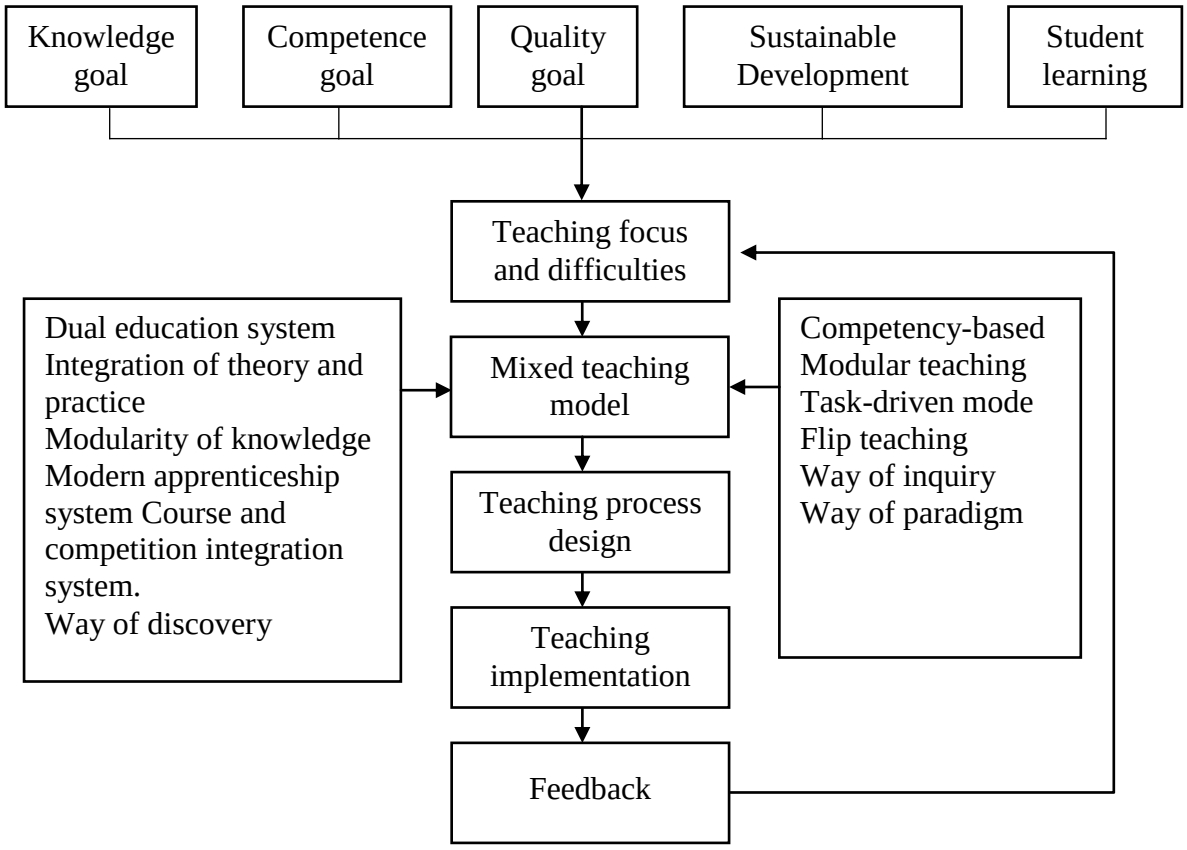

Figure 1.2 - Practice process of mixed teaching model of vocational education based on internet

Source: Prepared by the author

Of course, the widespread application of internet teaching in vocational education is only a beneficial supplement to traditional teaching. The use of internet remote blended teaching mode can make up for many shortcomings in traditional teaching, thereby enhancing the enthusiasm of vocational school students to actively participate in learning, helping them better acquire knowledge and abilities, and continuously improving the quality of education and teaching. Therefore, in the The Internet Age, the Internet based hybrid teaching model will become a useful supplement to various

teaching methods, enrich the form and content of teaching, and enable students to receive education, master knowledge and improve their ability at any time and anywhere. Especially in the current special period of large-scale epidemic around the world, it reflects the unique advantages of this teaching method (Nataliya et al., 2020).

Rural vocational education will be fully valued and developed. By conducting vocational education in rural areas, we aim to enhance the knowledge and skills of rural populations, thereby enhancing their ability to create wealth. The modernization construction of rural areas needs to tell us that farmers need to possess more scientific knowledge and technical skills, enhance their professional abilities, and thereby improve production quality and labor efficiency. Only in this way can we more effectively improve the speed of economic development in rural areas. Therefore, the further development of rural vocational education is an inevitable choice for rural regional economic progress (Zhao., 2021).

Compared to cities, rural areas in most countries are in a relatively poor and backward state, which is a practical problem that many governments must face. Of course, solving these problems can be achieved through numerous methods and approaches. Amartya Sen, the winner of the Nobel Memorial Prize in Economic Sciences, believed that the essence of poverty is ability poverty, and the poor people lack the skills of production and life when studying poverty. In addition to policy issues, it is very important to improve the quality of farmers themselves and enable them to master more production and operational skills, so that they can better position themselves and adapt to the needs of society in today's market economy. Vocational education can help farmers enhance their professional abilities and improve their own abilities, making vocational education an effective way to solve rural problems.

Firstly, in terms of policies, more policies will be introduced that are conducive to the sustainable development of rural vocational education. By improving their overall quality through vocational education, it can help farmers better adapt to the requirements of their work, thereby increasing their income and happiness.

Secondly, the planning and layout of rural vocational education will be fully valued. By increasing financial investment, actively implementing per student funding,

ensuring the welfare and treatment of teachers, striving to narrow the education gap between urban and rural areas, reflecting educational fairness, rural vocational education will truly be closely linked to regional economic development in the overall development direction.

Vocational schools should also actively connect with local departments such as commerce, agriculture, forestry, and human resources based on the characteristics of regional economic development, market conditions, and the education level and personal qualities of the trainees. They should also set up majors and establish corresponding curriculum systems. We need to strengthen the construction of the teaching staff according to the needs of teaching, and cultivate a group of double qualified teachers who can teach and do well, so that they can meet the teaching requirements of vocational education (Zhao et al., 2021).

Vocational education will pay more attention to the integration of industry and education. Deeply integrating industry and teaching is a new approach for vocational schools to improve the quality of practical teaching, thereby improving the quality of education and employment rate, and enabling school teaching to cultivate talents more in line with industry needs.

The integration of industry and education in vocational education combines market demand, characterized by innovation driven and industrial transformation and upgrading, and implements the entire teaching process according to national or local industrial development plans and needs. It is a strategic measure for promoting the cultivation of innovative and applied high-quality talents in vocational education reform, closely related to the prosperity and development of the economy and society.

The goal of vocational education is to cultivate technical and skilled talents required in production, management, and service for the development of the social economy. This requires referencing the market's demand for talent, scientifically and reasonably constructing a professional curriculum system that is consistent with industry requirements, and cultivating talents that are in line with market demand.

Of course, the teaching model of integrating industry and education requires teachers to be familiar with the skill requirements, equipment conditions, production

processes, industry frontiers, etc. of their respective majors in production enterprises, in order to impart knowledge and skills closely related to production practice to students in enterprises established based on different majors. These knowledge and skills may exceed the original abilities of teachers, so teachers must constantly improve their abilities and literacy from the perspective of production practice to meet the teaching requirements of integration of industry and education. This also requires schools to cultivate a teaching staff that can integrate production and teaching, as well as teaching and research, in order to meet the teaching requirements of integrating production and teaching.

The integrated teaching model of industry and education, which emphasizes the targeted and effective learning of students, as well as the adaptability to future employment, is more in line with the needs of the market economy and can provide strong support for the rapid development of the social economy (Zhao., 2022).

Vocational education will present a trend of cluster development. Clusters were originally regarded as an interdisciplinary research topic, becoming research objects in disciplines such as ecology, computer science, and economics. In the field of ecology, "cluster" refers to the aggregation form and symbiotic relationship of different populations in the same habitat. In the field of computers, "cluster" refers to a group of independent computers interconnected through high-speed networks, forming a group and managed in an integrated system mode. In economic concepts, clusters are used to describe the geographical concentration of a series of interconnected enterprises and institutions in a specific region in pursuit of higher production efficiency (Zhang., 2022).

Similar to the fields of ecology, computer science, and economics, there is also a cluster phenomenon in the field of education. In recent years, with the prominent role of education integration in promoting regional economic development, education clusters with core characteristics of resource integration, economic innovation, and talent cultivation have become a focus of research on regional education development. Scholars have pointed out that education integration should be regarded as an important tool for regional economic development, and based on this, regional

education horizontal and vertical cluster development models have been constructed. The vocational education cluster is defined as a structural association, development synergy, and effective flow of innovative elements such as knowledge, talent, information, and resources formed by the vocational education system and other related systems within adjacent geographical regions, in order to improve their own competitive advantages and the overall development level of the local society, through mutual connection and organic integration A new type of commonwealth organizations that integrates governance.

The development concept of vocational education clusters is an important component of the public education system. There is an interactive and symbiotic relationship between vocational education and regional economy. Applying cluster theory to the field of vocational education not only provides important ideas for the high-quality development of vocational education, but also provides intellectual resources and talent support for the construction of regional economic circles.

1.2. Foreign experience of personnel management of Chinese professional educational institutions

The report of the 20th National Congress of the CPC clearly put forward "optimizing the orientation of vocational education type", and again defined the development direction of vocational education. In May 2022, the revised "Vocational Education Law" was officially promulgated and implemented, marking the legislative clarification that vocational education is a type of education with equal importance to general education, providing legal protection for promoting the transformation of vocational education from "level" to "type". In December 2022, the state issued the "Opinions on Deepening the Reform of Modern Vocational Education System Construction", reaffirming the positioning of vocational education, which is to serve the comprehensive development of people, establish and improve a gradient vocational education and training system with multiple forms of connection, multi-channel growth, and sustainable development, so that students with different endowments and

needs can choose and diversify their talents multiple times. In order to deeply implement the spirit of the 20th National Congress of the CPC Continuously promoting the construction and reform of the modern vocational education system and optimizing the positioning of vocational education types indicate the direction for progress.

In recent years, a series of important laws, regulations and policies have been introduced in vocational education, providing important support for optimizing the positioning of vocational education types and further deepening Chinese vocational education reform. At present, various vocational education institutions cultivate approximately 10 million high-quality technical and skilled talents for the country every year; Vocational education institutions across the country offer more than 1300 majors, closely following market demand, continuously adjusting and optimizing, and basically covering various fields of the national economy. Vocational education is taking advantage of the situation, actively implementing the integration of industry and education, continuously strengthening connotation construction, and shining with vitality in promoting high-quality development. Of course, in this development process, China has combined its own characteristics of vocational education development and learned from many valuable experiences of foreign vocational education development. These innovative experiences have promoted the development process of China from a big country in vocational education to a strong country in vocational education.

Germany's experience in dual vocational education.The German "dual system" education model is a successful vocational education model, with nearly a thousand cross enterprise training centers built throughout Germany, which can fully utilize the advantages of vocational schools and enterprises, providing over 140000 enterprise training positions, reflecting Germany's vocational education philosophy of emphasizing ability and practice.

The teaching plan and training rules of vocational education in Germany are uniformly formulated by the education management department, and combined with the unified IHK vocational ability qualification exam, the training and assessment methods of vocational education are unified, which is conducive to cultivating

high-quality talents suitable for industry needs. At the same time, the dual teaching model of enterprise technology and school teaching content are closely related, ensuring that students' learning content can be closely related to the technology applied by the enterprise. Students' practical activities in enterprises come from real enterprise projects. Students can Close encounter with the latest production process and the most advanced technology of the enterprise, and can deeply understand the enterprise's process production specifications. This can ensure that students can quickly be competent for the enterprise's work when they graduate, and also save a lot of new staff training time for the enterprise.

Since the 1980s, Chinese vocational education has attempted to introduce the German "dual system" teaching model and conducted pilot projects in some regions. Currently, the "dual system" model has been widely popularized in secondary vocational colleges and fully explored in higher vocational colleges. In the process of learning from Germany's dual system vocational education model, China promulgated the Vocational Education Law of the China in 1996, which provides legal and policy support for the development of vocational education.

The "dual system" teaching model in Germany places higher requirements on the teaching and practical abilities of vocational education teachers. The dual system not only requires teachers to be competent in theoretical teaching, but also requires them to have rich practical abilities, and practical abilities must be able to keep up with the development of science and technology. In recent years, Chinese vocational education institutions have referred to the requirements of Germany's dual system for teachers, attached great importance to the training of teachers' theoretical and practical skills, established a teaching team in accordance with strict professional standards, strengthened teacher technical ability training, and ensured that the level and ability of vocational education teachers meet the teaching requirements.(Yuan et al., 2019)

Germany has established legal regulations on the rights and responsibilities of vocational education, and by strictly following the law to complete relevant work, it ensures the normal supervision and management of the vocational education process. German vocational education has set external quality evaluation standards to promote

the development of educational quality. They conducted quality evaluations from two levels, establishing school quality standards and teacher education standards. Among them, school quality standards are the control and constraints of schools in education, teaching, and management. Teacher education standards are the global basic teacher standards that teachers in various subjects should possess. In addition to mastering certain theoretical education knowledge, teachers should also be able to evaluate students' learning outcomes and actively improve their own quality. The professional standards for teachers provide effective guarantees for the standardized development of vocational education.

Vocational schools in Germany have internal quality management systems that enable timely evaluation of their internal management. The internal evaluation department of the school specifically collects relevant data based on the school's educational objectives and corresponding quality indicators, and ultimately forms an internal control system. Based on a wide range of data resources, the system evaluates the entire teaching process, Be able to form a final quality inspection report, identify problems that need to be corrected during the teaching process based on the final report, and actively correct them, thereby effectively improving the quality of teaching.

The use of third-party supervision to ensure the effectiveness of quality evaluation is a common quality management method in Germany. The evaluators of third-party institutions are generally experts who have been recognized by relevant institutions, have received systematic training, have a high level of research and rich management experience, and are very familiar with the operational process of vocational institutions. They conduct comprehensive evaluations of vocational schools and provide corresponding external suggestions by understanding the information and data obtained from multiple channels, And by drawing on the experience of other external schools in running schools, effective strategies are provided for the improvement process of the evaluated school to avoid vocational colleges blindly improving the teaching process and making it difficult to achieve the ideal teaching effect. In addition, thanks to the strict examination system, students in Germany who participate in vocational education have relatively high enthusiasm for learning, and

the learning process is very proactive. The strict examination system is an important reason for its high internal drive (Fu et al., 2022).

Based on the experience of Germany, China is continuously accelerating the legalization process of vocational education to meet the requirements of modern vocational education development. In 2022, China's new Vocational Education Law was promulgated and implemented, clarifying that vocational education is an important form of education to improve the quality and technical skills of workers, promote employment and entrepreneurship, build an educational, human resource, and skilled society, and promote socialist modernization. It further clarifies the definition of vocational education, demonstrates its important position, and strengthens the main body of vocational education, Enriching the forms of vocational education is a guiding document for Chinese vocational education, which will have a long-term impact on the development of Chinese vocational education.

Switzerland's experience of parallel general and vocational education systems. Switzerland's vocational education has always been at a world leading level. The Swiss federal and state governments, as well as industry organizations, have unified decision-making, layered implementation, and close cooperation, providing youth with diverse choices and flexible learning paths such as secondary and higher vocational education and applied technology universities, achieving coordinated development of vocational education and industry, and reducing youth unemployment rate; The successful 'modern apprenticeship system' also ensures a balance between income and expenditure in enterprise vocational education investment. Among countries implementing cooperative vocational education systems, Switzerland's vocational education has higher integration and openness, better governance effectiveness, and the greatest training benefits. This has important theoretical and practical significance for China (Jin et al., 2017).

The biggest feature of Education in Switzerland is that it has established a dual track education system of general education system and vocational education system. In this education system, higher vocational education and applied technology universities complement and communicate with each other, and the certificate system

is connected with the National Qualification Framework, making it a truly modern education system. Switzerland's vocational education system can adapt to social needs, effectively promote economic development, meet the diverse needs of the masses, achieve coordinated development of education at different levels and types, and reflect the concept of lifelong education.

The main experience of vocational education in Switzerland is as follows: firstly, the Swiss dual track vocational education system is more coordinated internally, and this system is an integral part of the lifelong education system. The scope of vocational education far exceeds the scope of traditional education. Vocational education in Switzerland has strengthened vocational cognition and career education at the compulsory Educational stage stage. Vocational education and general education are mutually penetrated, providing more options for learners' development, including inspiring learners' learning awareness, rather than developing school education in a narrow sense.

Switzerland's leading foundation in vocational education worldwide is its vocational education management mechanism and system, which is characterized by cooperation and co governance among multiple subjects. The purpose of establishing a modern vocational education system is to improve the management ability of vocational education, that is, to achieve modernization of educational governance. Firstly, in terms of governance structure, the rights and responsibilities of federal, state, and third-party governance entities were clarified. Secondly, in the governance process, it is emphasized that it is managed by the federal and state governments, jointly funded by the federal, state, and third parties, and implemented by the state governments and third parties. In terms of the investment mechanism for vocational education, vocational education funds include public funds, vocational education funds, and direct investment from enterprises. The Swiss federal government, state governments, and industry organizations are the three main sources of funding. Finally, in terms of the governance effect of vocational education, a reasonable vocational education system results in a high degree of coordination between the educational structure and industrial structure.

Although Switzerland has different stages of economic development from China and its national conditions vary greatly, Switzerland's economic structure based on developed manufacturing and modern service industries, as well as its adopted market economy model, are very similar to China's chosen development path. This provides valuable experience for Chinese vocational education development. Firstly, the whole society deeply recognizes the importance of vocational education and clarifies the standards for talent cultivation at all levels of education, Establish a bridging system based on qualification standards. Secondly, clarify the rights and responsibilities of all parties, and improve the governance mechanism of diversified participation in vocational education. These two aspects are well reflected in the management philosophy of modern vocational education in China, and have played a huge role in promoting the construction of a modern vocational education system in China.

Experience in New Zealand's Vocational Education Curriculum Connection System. New Zealand has the world's advanced vocational education system. In particular, the experience of New Zealand's vocational education curriculum linkage system has played an important role in China's successful construction of this system.

According to the Education Act 1989, the New Zealand government established a Qualifications Review Committee in 1990, which was later renamed the Qualifications Authority. Its main responsibility is to coordinate and manage various qualifications and diplomas across the country. In 1990, under the auspices of the Qualifications Agency, the New Zealand government developed a nationally unified qualification framework system. This qualification system divides various types of education and training after compulsory education, as well as corresponding academic and vocational qualifications, into ten level levels based on the required knowledge and skills, professional abilities or academic level, basic length of schooling, and level of education and degree. Each subject in each level has corresponding standards, clearly specifying the knowledge, skills or technologies, abilities, etc. that students should master. The educational qualification standard is the standard used by the state to recognize an individual's learning outcomes or abilities, as well as the basis for

national certification and certification of educational institutions' curriculum, skill assessment and appraisal.

Under the guidance of educational qualification standards, vocational education institutions set majors and develop corresponding courses based on regional talent demand. New Zealand's educational institutions can collaborate with businesses and industries to develop various courses, but courses must undergo unified quality inspection and certification by the National Qualifications Agency before being offered to the public. The Academic Qualifications Administration has established unified standards for course approval and recognition, including course names and objectives; Teaching and learning methods of the course; Evaluation method; The feasibility of the course; Course rules; Curriculum resources; There are a total of 7 standards for evaluation and review. Most vocational education institutions adopt a modular curriculum (or learning unit) operation approach, which focuses on vocational abilities and develops learning modules based on vocational ability units or elements. Each module contains several courses (even courses at adjacent levels), corresponding to corresponding credits. The curriculum modules are relatively independent and closely connected, pointing to the talent training goal together, and ultimately cultivating competent workers, problem solvers and Lifelong learning.

The New Zealand government occupies a leading position in curriculum integration, with a unified academic qualification standard as the core, fundamentally solving what students at different levels learn, to what extent they learn, and what corresponding curriculum resources are provided, ensuring unified teaching quality, unifying the methods and channels of vocational qualification certificates and diploma certification, and successfully achieving curriculum integration, thus achieving the integration of vocational education and industry industry in terms of content Effective connection between general education and lifelong education.

In 2014, China proposed in the "Decision on Accelerating the Development of Modern Vocational Education" to "establish a sound curriculum connection system", "establish a linkage development mechanism between professional teaching standards and vocational standards", "promote the integration of professional settings,

professional course content and vocational standards, and promote the connection of training objectives, professional settings, teaching processes, and other aspects of secondary and higher vocational education". Based on the experience of New Zealand, Chinese vocational education has established a standard system for academic qualifications under the leadership of the government. Currently, a relatively complete framework system for vocational education qualifications has been formed. In the corresponding New Zealand ten level qualification framework system, levels 1-4 are certificate training, equivalent to secondary vocational education in China; Level 4-6 is a diploma education, equivalent to College Level higher vocational education in China; Level 5-8 is degree education, equivalent to undergraduate education in China; Levels 8-10 are for graduate education. The vocational qualification standards are based on a competency based curriculum perspective, and each level of qualification has clear requirements for knowledge, skills, and applied abilities. At the same time, the hierarchical requirements of different standards reflect the inherent laws of knowledge from shallow to deep, skills and techniques from simple to complex, and comprehensive application ability from weak to strong (Qi et al., 2015).

The construction of this system reflects the integrated development of knowledge, skills, and abilities, integrating vocational certificates and academic certificates, and achieving credit mutual recognition and transfer under the premise of quality monitoring and guarantee, thus providing strong support for the construction of a modern vocational education system with Chinese characteristics.

Characteristics of Denmark's vocational education and training system. The Danish vocational education and training system originated from the medieval apprenticeship system and has a history of more than 100 years. The well-established Danish vocational education and training system today exhibits four major characteristics: high participation, flexibility, inclusiveness and dynamic development (Guo et al. 2018).

The vocational education and training system in Denmark is a type of education and training that enables students to master technical skills in a certain professional field through training, ultimately obtaining relevant vocational qualifications. The

training system in Denmark also implements the principles of dual training, stakeholder participation and Lifelong learning.

Referring to the characteristics of Denmark's vocational education and training system, China also attaches great importance to high participation in the entire system construction process. China has fully mobilized various social forces and attracted more resources to converge towards vocational education. The government's education management department fully encourages various vocational education stakeholders such as industry associations, vocational education institutions, enterprises, teachers, and students to make proactive contributions to the construction and development of the modern vocational education system.

In the flexibility construction of the modern vocational education system in China, the government has strengthened the top-level design of the vocational education system, improved the laws, regulations, and basic systems for system construction, management, and operation, encouraged various regions to explore the construction mode of the modern vocational education system according to the development needs of regional economy, society, and human resource market, promoted the diversified development of modern vocational education, and developed various types of vocational education courses, To fully meet the diverse needs of individuals, individuals can have the opportunity to participate in education and training according to their own wishes and needs at all stages of career development, thus forming a sense of high-quality education in the whole society, and enhancing the attractiveness of vocational education.

The construction of China's modern vocational education system adheres to the people-oriented educational philosophy, making it a platform for everyone's comprehensive development, without excluding any learners due to factors such as age, educational level, and background. This system covers different types of students starting from junior high school graduates. Regardless of the initial educational background of the educated, they can find suitable vocational training programs in the modern vocational education system of China. Based on students' strengths and specialties, they can be trained into high-quality workers and technical skilled talents,

and can also reasonably compensate for and accommodate students' shortcomings and weaknesses, Thus, modern vocational education can truly become an education for everyone.

Drawing inspiration from the dynamic development concept of Denmark's vocational education and training system, China combines the continuous development and changes of the social and economic external environment with the development of the vocational education system, which can better respond to various challenges brought about by economic globalization and adapt to the constantly changing external environment's requirements for vocational education and training.

With the development of the world economy and technological progress, people engaged in professional and technical positions have experienced a phenomenon of shortened knowledge half-life and accelerated decline in professional abilities. They have about 50% of their vocational skills that need to be updated every 3-5 years, which requires workers to have a common, transferable, non perishable ability that plays a crucial role in their future development. Key competencies refer to basic skills that are essential for engaging in any profession beyond specific professional skills and knowledge. This skill can be applied to various fields of human existence, such as school, professional life, family life, etc., to meet or solve various needs and tasks in people's daily, professional, social and other lives.

Belgium has put forward several requirements for key competencies: firstly, diversity, which involves knowledge, foresight, skills, and attitudes; The second is accessibility, where key competencies can be acquired in various contexts, formal or informal, conscious or unconscious; The third is targeted, with appropriate answers for a specific situation or task; The fourth is predictability, which can make effective responses at any time and under any conditions, and key competencies have predictive value for actual behavior; The fifth is transferability, which can be obtained in various situations; The sixth is versatility, which can achieve various goals, solve different problems, and complete different tasks (Yang et al., 2010).

Belgium divides key competencies into six major categories and fourteen specific competencies. These contents are shown in Table 1.2.

Table 1.2- Key competencies and specific competencies of Belgium

Key competencies	Describe	Specific competencies
Social competence	It refers to the competence of individuals to effectively and constructively participate in group interactions in public places such as families and units.	Actively participate in social activities in various fields.
		The ability to engage in constructive communication in different social situations.
		Ability to cooperate, tolerate others' opinions and behaviors, and be aware of individual and group responsibilities.
Self affirmation competence	It refers to a person's self-concept in their own mind, including their understanding and evaluation of themselves.	People with a positive self impression are optimistic, open-minded, willing to cooperate with others, and have active thinking, firm will, and innovative spirit.
Self growth competence	It refers to the acquisition, evaluation, and absorption of new knowledge and problem-solving, as well as the application of new knowledge and skills in family, work, and study, enabling critical self reflection.	The ability to obtain and process information.
		Ability to solve problems.
		Self guidance and self-restraint.
		Critical, reflective behavior and thinking.
Motivational competence	Individuals are willing to change themselves, further enhance their motivation and abilities, and have a self-awareness that believes they will eventually succeed.	Having the courage to explore and eager to learn.
		Self awareness.
Quick thinking	Individuals possess logical and critical thinking abilities, are able to take proactive action, have a positive attitude towards change and innovation.	Creativity.
		Flexibility and adaptability.
Skill	Individuals have the ability to apply scientific knowledge and methods to solve daily life problems, as well as good communication skills.	Language proficiency.
		Operation ability.

Source: Prepared by the author

Various schools in Belgium are permeated with the cultivation of key competencies in the education process. Primary education in Belgium places great emphasis on cultivating students' creative thinking and communication skills. In a painting competition held in a primary school, the students were unrestrained and their

works were also diverse. Surprisingly, each child was able to speak out about their own works. In the end, all the children who participated in the competition received the same prize, with no distinction between high and low rankings. The principal said that these seemingly entertaining activities are actually a form of training for students' comprehensive abilities by the school. They involve cultivating children's divergent thinking, developing their eloquence, improving their daily observation skills, and establishing a team spirit. What schools need to do is not to assign levels to each child, but to encourage them to unleash their creativity as much as possible, cultivate their personality, independence, and quick action abilities through play, and cultivate students' key competencies from another perspective.

In schools in Belgium, the cultivation of students' key competencies is carried out in a flexible manner, incorporating key competency related content into the curriculum system. Advocate teacher-student interaction, participate in classroom learning together, take students as the center, start from handling the simplest typical events in life, and timely encourage students in language to strengthen their learning motivation, stimulate their interest in learning, and enhance their key competencies.

The key competencies planned by the Belgian education authorities to adapt to the current world economic and technological development have important implications for the cultivation and development of Chinese technical and skilled talents.

Firstly, Chinese vocational education emphasizes the development of individual personalities among students. We can see that corporate employers are increasingly focusing on the personal qualities of their employees. China emphasizes the cultivation of individual comprehensive professional qualities while paying attention to the harmonious and healthy development of each individual, meeting diverse requirements, releasing personality energy, and promoting the harmonious development of personality, especially human values, understanding, judgment, and critical thinking spirit.

Secondly, a new concept of vocational education has been constructed. Through Belgium's definition of critical abilities, Chinese vocational education managers see

that critical abilities are neither professional technical knowledge nor a specific technology. They emphasize transferability and versatility, emphasizing the cultivation of basic abilities. Therefore, vocational education should impart students' common, universal, and core abilities in their career, namely critical abilities. China draws inspiration from Belgium's education and cultivation of key competencies, and combines it with China's national conditions to reform and innovate existing ways and methods to enhance key competencies, continuously improving the quality of talent cultivation in vocational education and better serving economic and social development.

Chile's Vocational Education Reform Thought. Mining, forestry, fisheries, and agriculture are the four pillar industries in Chile. In order to achieve a higher level of industrial development, vocational education has received sufficient attention and good development in Chile. Chile's vocational education is highly market-oriented, fully leveraging the role of private enterprises in vocational education and training. The government encourages and supports on-the-job training through tax reduction and subsidy policies, and provides public training programs for on-the-job employees. Chile actively engages in international cooperation in vocational education and actively learns from foreign vocational education experiences, assist in the development of vocational education.

There are two main types of financing systems for vocational education in Chile: first, direct financing, with public or private suppliers providing funding directly; The second is indirect financing, which is supported by relevant departments, enterprises, etc. through subsidies or scholarships. The government provides subsidies to company based training programs through tax refunds and funding for public training programs, reaching a certain threshold, enterprise training expenses can be deducted from taxable profits or other taxes. The government allows companies to deduct training expenses from taxes and fees, while also providing public training programs for jobs not covered by private enterprise training programs. In addition, Chile's unique education voucher system is also a major source of vocational education funding. In order to achieve the goals of increasing parents' right to choose schools, strengthening

competition between schools, reducing Social cost, improving school efficiency, improving education quality and efficiency, and improving education fairness, Chile began to implement the primary and secondary school voucher program in 1980. The first two types of schools in the first two types of primary and secondary schools of the three types of public schools, private aided schools, and private fee-paying schools will implement the education voucher plan. Public and private funded schools participating in the education voucher program mainly receive corresponding funding based on the number of students registered. Schools managed by the government directly receive monthly funding based on the education vouchers received by each school. Vocational schools managed by non-profit organizations are generally paid by the government in a lump sum (Zhang., 2015).

Chile's vocational education has undergone reforms characterized by decentralization and privatization to promote the flourishing development of vocational education. Drawing on the successful experience of Chile's vocational education reform and development is beneficial for Chinese vocational education reform and development to avoid detours and carry out smoothly and efficiently. In summary, vocational education in Chile is highly market-oriented, fully leveraging the role of private enterprises and companies in vocational education and training; A series of effective methods and measures have been formed in carrying out vocational education based on abilities and strengthening the connection between vocational education and enterprises and institutions; Encourage and support on-the-job training for enterprise employees through multiple channels, such as reducing and refunding taxes, providing subsidy policies, and providing public training programs for on-the-job employees; Chile attaches great importance to learning from the successful experiences of vocational education in countries such as Germany, France, and Italy, and conducts vocational education cooperation with these countries through multiple channels and forms. These practices are in line with the current direction of vocational education reform in China. Chile's vocational education, which has gone through this stage of development, will provide appropriate reference for the development of vocational education in China.

The curriculum certification between Australian vocational education and universities is interconnected, and the educational framework is interconnected. Students who complete certain courses at TAFE College after high school can also receive university bonus points. Vocational education in Australia begins to permeate from the secondary school stage, offering vocational education and professional education enlightenment to students through elective vocational courses, preparing them for vocational education or university professional learning in the later stages of secondary school.

In 1995, the Australian government announced the Australian Qualifications Framework (AQF), which specifies that Australian qualifications are divided into 10 levels. After completing the corresponding vocational education courses, high school students can obtain Level 1-3 qualification certificates. If students enter TAFE College, their vocational courses taken during high school can be credited accordingly. TAFE College can award certificates at levels 1-6, as well as vocational education graduate certificates and graduate diplomas. At TAFF College, students receive Level 5 certificates corresponding to associate degrees, while Level 6 certificates correspond to advanced associate degrees. TAFF College also collaborates with universities to create a sustainable pathway for students to pursue their academic qualifications through a direct route from associate degree to undergraduate degree. Students can pursue undergraduate to graduate studies at the cooperating universities, with a maximum of obtaining a Level 10 certificate, which is a doctoral degree (Sha., 2020).

The success of vocational education in Australia is inseparable from the protection of regulatory agencies and laws and regulations, and benefits from the curriculum packages jointly developed by industry enterprises, schools, and the government. The curriculum package has a unified teaching content and evaluation standards, and any school must conduct teaching and evaluation based on the quality standards of the curriculum package. Therefore, teaching evaluation plays an important role in improving the quality of vocational education in Australia.

China has learned from the experience of Australian vocational education and first strengthened the connection between the education system and qualification

certificate certification. Graduates of secondary vocational schools can enter higher vocational schools through the college entrance examination to obtain a college or undergraduate degree. Graduates at the college level can enter higher-level schools through the process of upgrading from college to undergraduate to obtain a bachelor's degree, which has preliminarily established a channel for vocational school students to promote their academic qualifications. At present, many schools are also piloting the system of credit mutual recognition, strengthening the connection between the education system and qualification certificate certification.

Secondly, in recent years, Chinese vocational education has introduced teaching standards for various major directions in accordance with the continuous changes in market economy and technological requirements. These curriculum standards, jointly formulated by the government, industry, and schools, include many teaching links such as course teaching content, teaching requirements, evaluation standards, and play an important role in ensuring teaching quality.

Australia also has unique mechanisms for diversified teacher development. TAFE College teachers in Australia mainly come from industry enterprises. Only employees with 5 years of industry work experience and the required qualifications and diplomas can apply for the position of college teachers. These teachers not only have practical experience to be qualified for the teaching work of the college, but also hold professional and technical positions in related industries and enterprises, maintain close contact with enterprises, and bring industry experience into classroom teaching at any time. At present, vocational colleges in China have also increased their efforts to introduce skilled craftsmen from the industry, focusing on recruiting dual qualified teachers who meet teacher standards from factories and enterprises. In addition, Chinese vocational schools support school teachers to work part-time in industry and enterprise related positions, increase the practical experience of the teaching staff, encourage teachers to actively participate in innovation and entrepreneurship activities, establish companies or studios, lead students to learn while working, and improve students' practical skills. These measures have enhanced the practicality of vocational education teaching content and improved the quality of talent cultivation.

Finland's vocational education competitiveness ranks among the top in the world. Among them, Finland's higher vocational education degree system has important inspiration and reference significance for China to build a higher vocational education degree system.

In the 1990s, in order to conform to the development trend of international higher education and vocational education, Finland upgraded and merged a large number of colleges and universities into a new regional Fachhochschule (UAS), with the purpose of repositioning some college students to a short-term and practical education route, so as to improve the quality and attractiveness of higher vocational education and enable students receiving vocational education to obtain qualifications and opportunities for further education. The 2014 reform comprehensively adjusted the types of degree awards and shortened the duration. At the same time, in order to adapt to the transformation and upgrading of global industries and changes in economic growth patterns, Finland has realized the need to make necessary reforms to the education structure. On the one hand, the upward extension system within vocational education must be implemented; On the other hand, it is imperative to improve flexible learning paths.

In the past decade, the demand for vocational education students in Finland to continue receiving higher education has further increased. The Finnish Government is clearly aware of the adverse impact of the high unemployment rate, forcing it to follow the trend of "academic drift" and improve and implement the related issues of higher vocational education degree qualification certification.

As a vocational qualification, Finnish higher vocational education degrees closely integrate with the labor market and play a signaling role in society. By authenticating the skills and qualifications acquired during the learning period, effective interaction between education and work life can be achieved, which can maximize the motivation for people's learning and career development.

Finland has the degree awarding standard of Fachhochschule, which is different from ordinary universities. It uses a variety of multi-agent methods to evaluate the specific abilities that vocational education needs to cultivate, which ensures the

professionalization orientation of higher vocational education degrees. The degree construction of higher vocational education in China has drawn on the advanced experience of Finland, closely combining with the current development status of higher vocational education in China. Firstly, it is necessary to establish unified certification standards for higher vocational education degrees. At the same time, it is also necessary to clarify career orientation and highlight practical characteristics. The formulation of standards must be closely combined with the enterprise industry, which can reflect the current latest technological level and ability needs, and at the same time, clarify the ability to adapt to the needs of future social development. While students are recognized by the labor market, they can obtain the ability of future sustainable development, and enhance the potential of future development of vocational education. Secondly, enhance the effectiveness of evaluating higher vocational education degrees and adhere to a professionalization oriented approach throughout. The key lies in the composition of the evaluation team, in which the relevant personnel of the enterprise must occupy a certain proportion. For the general part of higher vocational education degrees and general education, teachers are responsible for evaluating, mainly including course learning effectiveness, whether the graduation thesis (design) is qualified, and whether general knowledge and abilities are possessed; The professional skills required for higher vocational education degrees must be evaluated by experts, highlighting the assessment of professional literacy. In addition to the standard of operating skills, professional development ability and Lifelong learning ability should be reflected in the degree standard of higher vocational education.

Improve the credit bank system. Receiving higher education has always been considered the key to achieving class mobility and leapfrogging, and the level of education is subject to the influence of various aspects such as family economic conditions and environment. The Finnish qualifications framework applies to everything from higher education degree certificates to vocational qualifications. The establishment of this system essentially guarantees that even students in different types of schools have the opportunity and right to receive higher education, and further ensures that all schools serve the interests and hobbies of students without distinction

of grade or level. The living space of different colleges is legally guaranteed, the equal rights of students are recognized, and both colleges and students can be treated equally in the higher education market. At present, China connects higher vocational education and general higher education to promote the exchange of needs between the two, so that learners can choose the type of education that suits them completely according to their interests. Accelerate the construction of higher vocational education and professional degree education system, grant degrees to students receiving vocational education to enhance their competitiveness in the talent market, and form a comprehensive higher vocational education system integrating "specialist-undergraduate-master". By running through the types of academic higher vocational education and non-academic vocational training, and by certifying the learning outcomes of non-academic vocational training, a complete national vocational qualification framework is constructed, and vocational education and training are regarded as a powerful part of promoting the construction of a lifelong education system (Lu et al., 2020).

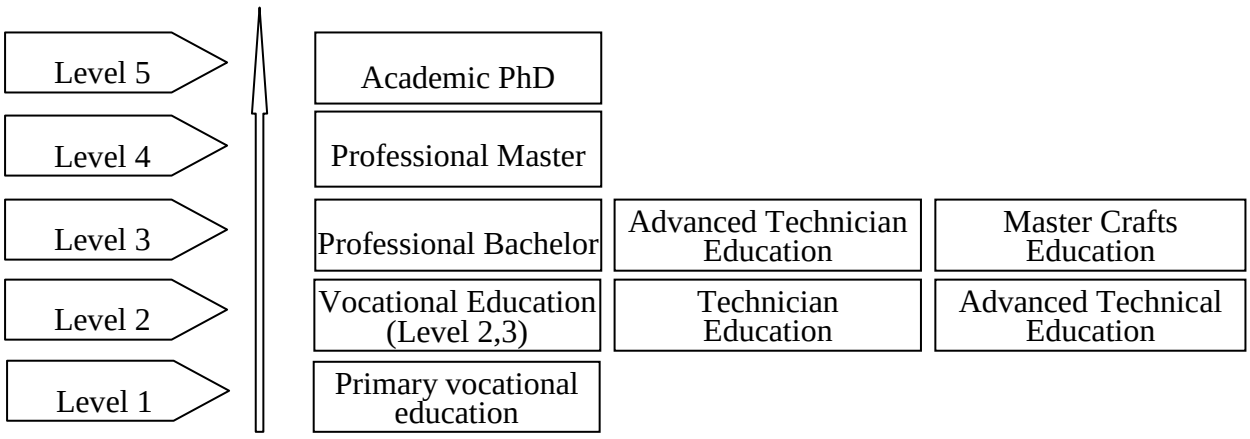

Figure 1.3- Luxembourg 5-tier Vocational Education Network

Source: Prepared by the author

As a highly developed country, Luxembourg's socio-economic development is closely related to its vocational education reform. Despite its small land area and small population, Luxembourg still has a complete, multi-level, and multi type vocational education system. Luxembourg's vocational education system covers all stages of the

national education system, from middle to higher education, with distinct levels and diverse types, providing vocational education learners with various learning opportunities. The vocational education in the country ranges from primary vocational education to secondary vocational education, and then to higher vocational education, covering a five tier network of vocational education, including doctoral programs (see Figure 1.3). Learners can flexibly configure and choose according to their learning status to achieve their learning goals.

A rich and flexible type of vocational education must have qualified teachers to ensure teaching effectiveness. All teachers engaged in secondary vocational education in Luxembourg must have a bachelor's or master's degree in the relevant field of teaching courses. Teachers who pass recruitment exams need to train while working and complete a 3-year training course at the National Education and Training Institute in order to become true teachers. This is one of the important measures taken by Luxembourg to ensure the quality of vocational education.

All Luxembourg companies involved in apprenticeships are required to strengthen the training of corporate masters. On the one hand, the Chamber of Commerce has established a special platform for corporate masters to provide on-the-job training programs and improve the teaching methods of corporate masters. On the other hand, Luxembourg has introduced relevant laws to improve the sense of responsibility of corporate masters in training apprentices. Relevant laws stipulate that enterprises must designate one or more enterprise masters for apprentices to provide guidance, including practical training, teaching supervision, and acting as the contact person of the chamber of commerce in the management of apprenticeship training. Except for enterprise masters who hold master crafts qualifications or other equivalent qualifications, they are not required to participate in mandatory training, and everyone else must regularly participate in training organized by the chamber of commerce. The training content involves many aspects such as law and teaching, providing guidance on training methods for enterprise masters, establishing a good relationship with apprentices and helping them integrate into enterprise work (Wu., 2021).

In China, a complete vocational education system has been established, which starts from the labor courses in primary schools to inspire students' career inspiration. Students who choose vocational education can start from secondary vocational education according to their own objective conditions, and can go all the way to higher vocational education, vocational education undergraduate, professional master's degree, and even doctoral level, which provides a steady stream of human resource support for economic development. At the same time, drawing lessons from the teacher training concepts of Luxembourg and other developed countries of vocational education, Chinese vocational schools need to conduct strict pre-job training before new teachers enter teaching positions, so as to meet the requirements of teaching positions and ensure the quality of teaching.

Experience in ensuring the vocational education system from France. France is a populous country in the European Union, and its economic growth mainly relies on the service industry. Economy of France has a very strong demand for all kinds of professional talents. The annual investment in education (including vocational education) is about 149.9 billion euros, accounting for 6.7% of GDP. The investment in continuing vocational education accounts for 1.1% of GDP. The number of vocational education people accounts for about half of the total number of people educated, which is enough to witness the scale of vocational education in France.

The origin of modern vocational education in France can be traced back to the French Revolution. The early French vocational education adopted a supply oriented development model. With the acceleration of economic development, this model is difficult to adapt to changes in external market demand, leading to a mismatch between talent cultivation and social demand, resulting in a serious contradiction in the supply of technical and skilled talents. To address this issue, vocational education in France has begun to shift towards a demand oriented model. This transformation requires strengthening the leading role of the government, strengthening the top-level design of vocational education, emphasizing the ability to predict and meet the constantly changing requirements of modern industrial production for labor, and highlighting the diversification of demand.

Unlike German vocational education, which mainly takes the form of apprenticeship, the characteristic of French vocational education is that it is mainly based on government led public school education. France prioritizes vocational education in its national development strategy, using legislation as a means to provide institutional guarantees for the development of vocational education. In order to address the discriminatory concept of vocational education in society, the French government has taken many measures, such as the exchange of general vocational education, the equivalence of certificates and diplomas, and encouraging multiple parties in society to participate in the qualification recognition of vocational education. The French government also issued a decree clarifying the position of vocational education in the national development strategy. At present, vocational education in France accounts for about half of the total number of people receiving education. The country and the public fully recognize the important role of vocational education in economic development, and have established the value of equality between general education and vocational education.

The National Investment Plan for 2018-2020, issued by France in September 2017, proposed the goal of vocational education reform. In October, the French President announced the reform of apprenticeship and continuing education in the field of vocational education. In November, the Prime Minister of France issued the guidance document for the reform. The 2018 'Free Choice of Future Career Act' emphasizes the transparency and efficiency of vocational education, and puts forward new requirements for vocational education and training providers. Under the guidance of central government laws and policies, local governments will formulate relevant regulations based on the specific situation of local vocational education to ensure policy implementation. These central and local laws and regulations cover all aspects of vocational education, including primary vocational education, secondary vocational education, higher vocational education, apprenticeship, continuing vocational education, etc. In 2022 alone, China introduced 33 policies, regulations, and systems related to vocational education (see Table 1.3), further improving the national vocational education system.

Table 1.3- Policies and regulations related to vocational education introduced in China in 2022

Time	Document Title	Document-Issuing Agency
January, 2022	New standards for the construction of professional training and teaching conditions in 18 vocational colleges	Ministry of Education
	Regulations on the Administration of Student Internship in Vocational Schools	Ministry of Education, etc
February, 2022	Notice on the Filing and Approval Results of the Establishment of Specialized Courses in Higher Vocational Education in 2022	Ministry of Education
March, 2022	Notice on the Establishment of the First Batch of Technical Education and Vocational Training Teaching Guidance Committees	MHRSS
	Implementation Plan for Promoting the Integration of Engineering and Learning in Vocational Colleges and Universities to Cultivate Skilled Talents	MHRSS
	Management Measures for the Establishment of Undergraduate Vocational Education Majors (Trial)	Ministry of Education
April, 2022	Notice on Strengthening the Cultivation and Construction of Typical Schools for "Three Comprehensive Education" in Vocational Colleges	Ministry of Education, MHRSS
	Several Opinions on Strengthening the Teaching Management of Online Open Courses in Ordinary Higher Education Institutions	Ministry of Education
	Implementation Plan for Promoting the Integration of Engineering and Learning in Vocational Colleges and Universities to Cultivate Skilled Talents	MHRSS
	Notice on Publishing the Catalogue of 429 National Level Vocational Education and Vocational Training Textbooks	MHRSS
	Law of the People's Republic of China on Vocational Education	State Council
	Notice on the mid-term performance evaluation of the construction plan for high-level vocational schools and majors with Chinese characteristics	Ministry of Education,Ministry of Finance
May, 2022	Notice on Holding the Third National Vocational Ability Competition for Teachers in Technical Colleges and Universities	MHRSS
	Notice on Carrying out Action to Enhance the Ability of Vocational Education Teachers	Ministry of Education
	Guiding Opinions on Accountability of Textbook Work	Ministry of Education
	Notice on Carrying out the Pilot Project of Digital Campus Construction in the First Batch of Vocational Colleges	Ministry of Education
	Public Basic Curriculum Plan for Technical Colleges (2022)	MHRSS
June, 2022	Notice on Carrying out 2022 Technical Education and Vocational Training Teacher Ability Improvement Activities	MHRSS

Continuation table 1.3

July, 2022	Measures for the Selection and Supervision of Vocational Education and Training Evaluation Organizations (Trial)	Ministry of Education
	National Occupational Classification Dictionary (2022 Edition)	MHRSS
August, 2022	Notice on Carrying out the Selection of National Online Excellent Courses for Vocational Education in 2022	Ministry of Education
	Implementation Opinions on Promoting the Reform of Continuing Education for Academic Degrees in Ordinary Higher Education Institutions in the New Era	Ministry of Education
	Announcement of the Integrated Curriculum Standards and Curriculum Offerings for Training Skilled Talents in 31 Professional Countries (Trial)	Ministry of Education
September, 2022	Implementation Plan for the Construction Project of National High Skilled Talent Training Base and Skill Master Studio	MHRSS, Ministry of Finance
October, 2022	Opinions on Strengthening the Construction of High Skilled Talents in the New Era	CPC Central, State Council
	Notice on Further Strengthening the Construction of Teaching Innovation Teams for Teachers in National Vocational Colleges	Ministry of Education
	Notice on Building a Batch of National "Double Teacher" Teacher Training Bases (2023-2025)	Ministry of Education
November, 2022	Implementation Plan for the Compliance Project of Vocational School Running Conditions	Ministry of Education, etc
	Corresponding Table of Disciplines for Granting Bachelor's Degrees in Higher Vocational Undergraduate Majors	Ministry of Education
	Standards for Setting up Secondary Vocational Schools for Disabled Persons	Ministry of Education, etc
December, 2022	Training Standards for Integrated Engineering and Learning Teachers in Technical Colleges (Trial)	MHRSS
	Opinions on Deepening the Reform of Modern Vocational Education System Construction	CPC Central, State Council

Source: Prepared by the author

They set clear responsibilities and requirements for the participants of vocational education - the central government, enterprises, educators, local governments, etc. - to ensure the effective implementation of vocational education policies and form a

relatively complete legal system for vocational education, It has played an important supporting role in the development of vocational education (Chang., 2020).

Seance the reform and opening up, China has made gratifying achievements in the governance capacity and institutional construction of vocational education. The Proposal of the Central Committee of the CPC on Formulating the Fourteenth Five Year Plan for National Economic and Social Development and the Vision of 2035, adopted at the Fifth Plenary Session of the 19th Central Committee of the Communist Party of China, proposed that "we should increase human capital investment, enhance the adaptability of vocational and technical education, deepen the integration of vocational and general education, industry and education, school enterprise cooperation, explore the apprenticeship system with Chinese characteristics, and vigorously cultivate technical and skilled talents", and constantly improve the governance ability of vocational education.

China continues to promote the modernization of the governance system and capacity of vocational education. According to the laws of vocational education development and the basic requirements for the modernization of vocational education, based on type education, focusing on building a new relationship between the government, schools and society, and focusing on system innovation, a pattern of government Macromanagement, independent school running, extensive participation of industrial enterprises and other social organizations has been formed, Provide strong guarantees for the more dynamic and high-quality development of vocational education (Zhao et al. 2020). The improvement of vocational education quality is a systematic project that involves multiple factors such as national policies, socio-economic needs, and development trends. Therefore, in the process of building a vocational education system, drawing on the experience of developed countries' vocational education is also an effective way to improve the current comprehensive level of vocational education.

1.3. Methodical approaches and innovative aspects in personnel management of vocational education institutions

The construction of the teaching staff refers to the integration of the current human resources of the teaching staff through a series of management activities such as planned and organized regulation of teachers' teaching and daily management in the process of educational activity management in vocational education institutions, so as to better train, hire and promote teachers, and put them in more suitable positions to maximize their value, so as to achieve the management goal of optimizing the teaching staff. The level of personnel management in vocational education institutions can often be found in the quality of teaching staff construction. It can be said that evaluating the level of teaching staff construction of a vocational education institution indirectly evaluates the ability and level of personnel management of this institution.

It is not easy to build a faculty team with strong academic ability, good teaching effect, and good continuous learning and development. Because the construction of the teaching staff involves many aspects, such as the teacher assessment and incentive system, the teacher access system, and the teacher training system (Liu., 2007). The essence of the construction of the teaching staff is to effectively develop teacher resources, realize the rational allocation and full utilization of teacher resources, and continuously optimize and update the education structure, professional title structure and age structure in the construction process. Through the scientific management, effective development and rational utilization of teacher resources, the personal needs of teachers and the development goals of vocational education institutions are unified, and the enthusiasm of teachers is greatly mobilized, so that the two can develop together and achieve a win-win situation.

The research on the construction of teaching staff is a hot issue in the research of vocational education management at home and abroad. Improving the quality of teachers is a key breakthrough in improving the quality of education. At present, all countries in the world, especially developed countries, attach great importance to the

construction of teaching staff, which has become a key field of academic research at home and abroad (Wu., 2010).

In the process of construction and development of vocational education institutions, the construction of teaching staff has become an important part of the connotation development of vocational education. To improve the teaching quality level of vocational education institutions, the construction of teaching staff is the key factor. However, in many vocational education institutions, there is a lack of evaluation programs for the level of teaching staff construction. That is to say, although vocational education institutions pay attention to the construction of the teaching staff, the effect and degree of the construction of this team lack a truly scientific and reasonable system to regulate. In the process of building the teaching staff, many vocational education institutions only emphasize academic qualifications and majors, and do not fully consider the construction and development of the teaching staff from the key indicators of skilled personnel training, thus affecting the quality of the teaching staff construction. Therefore, it is necessary to establish a scientific and reasonable system for evaluating the level of teaching staff construction, and find out the main factors that affect the quality of teaching staff construction (Zhao., 2014).

There are two important aspects in the process of comprehensive evaluation of the construction of teaching staff: one is the design of the evaluation index system, and the other is to determine the functional relationship of each index's influence on the evaluation subject. At present, the comprehensive evaluation methods mainly include analytic hierarchy process, fuzzy comprehensive evaluation method, artificial neural network evaluation method, gray comprehensive evaluation method, data envelopment analysis method and Delphi method, etc. After research and comparison, on the basis of fuzzy theory (proposed by American professor LA.Zadeh in 1965), based on the principle of fuzzy mathematics, we use fuzzy algorithms to quantify fuzzy factors, and use fuzzy mathematics to comprehensively evaluate the construction of teaching staff, so as to scientifically draw evaluation conclusions. This method combines fuzzy mathematics and analytic hierarchy process, which makes the evaluation index include

both qualitative index and quantitative index. It is an ideal and effective multi-factor decision-making method.

The indicator system refers to the 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 teachers in vocational education institutions should follow the principles of scientificity, comprehensiveness, systematicness, comparability, feasibility and importance.

The construction of teachers in vocational education institutions is a multi-factor and multi-level complex system, which requires the combination of qualitative analysis and quantitative analysis to achieve an objective evaluation of the comprehensive quality of teachers. We divide the entire system of teaching staff into layers, each layer is composed of several evaluation factors, and evaluate the construction of teaching staff in vocational education institutions by quantifying the evaluation factors. In order to ensure the reliability and scientificity of the evaluation system for teaching staff construction, what needs to be done is to carry out in-depth theoretical discussion and analysis and demonstration on the selection of evaluation indicators (Zeng ., 2012).

To evaluate the construction of the teaching staff of vocational education institutions, the stakeholders involved are: employers, vocational education institutions themselves, students and teachers. Diversified stakeholders inevitably require us to evaluate the construction of teaching staff from multiple perspectives, and carefully consider the selection of evaluation indicators. In order to ensure the completeness and scientificity of the construction of the index system, this paper conducts on-the-spot investigation and research on several vocational education institutions. Through relevant interviews and questionnaire surveys of school leaders, teachers, students, etc., combined with professional and authoritative experts Consultation, collect detailed information on the construction of vocational education institutions' teaching staff, scientifically and reasonably screen indicators, so that they can complete and effectively evaluate the construction of teaching staff.

By combing the relevant research theoretical results of Chinese vocational education experts and scholars, it is found that the construction of teaching staff mainly focuses on the two aspects of teacher structure and "double-qualified" teachers. Therefore, it is taken as the first-level indicator of teacher team construction. Combined with field investigations and visits, two first-level indicators of teacher assessment system and professional construction and teaching reform are added. In terms of secondary indicators, the research mainly focuses on the evaluation indicators of domestic scholars and teachers. For the secondary indicators of "teacher structure optimization", the indicator of knowledge structure optimization status is added, and the secondary indicators of "professional construction and teaching reform" are reset (there is a lack of secondary indicators in the literature research). Other indicators are mainly derived from the secondary indicators in the literature research in Table 1.4.

Table 1.4- Summary of evaluation indicators for the construction of teaching staff of Chinese vocational education scholars.

Author	Research object	Index selection
Li Jialong	Higher Vocational Education	Teacher ethics, teaching work, scientific research, professional ability, practical ability
Tian Qingbin	Vocational Education	Teaching conditions, professional construction and teaching reform, teacher style, teacher treatment
Wang Zhiliang	Key vocational education	School positioning, teaching staff construction goals and construction measures, student-teacher ratio, and teaching staff structure
Zhou Mei	vocational education institution	Optimization of teacher structure, talent growth environment, incentive mechanism, improvement level of teachers' professional ability, "double-qualified" teachers, teacher assessment system, stakeholder satisfaction
Liu Junli	Private Vocational Education	Teaching status, scientific research ability, student training, discipline construction, management
Fan Weiqiang	Higher Vocational Education	Student-teacher ratio, dual-teacher structure, age structure of full-time teachers, education structure, quality structure, teaching volume, teaching ability, teacher training

Source: Prepared by the author

Based on the above research, the performance evaluation index system for the construction of teachers in vocational education institutions was finally determined, as

shown in Table 1.5. Among them, the evaluation indicators for the construction of teachers in vocational education institutions include four dimensions: the optimization of teacher structure, teacher assessment system, dual-qualified teachers, professional construction and teaching reform, with a total of 15 three-level indicators.

Table 1.5- Evaluation index system for the construction of teachers in vocational education institutions.

Target layer	Standard layer	Index layer
Evaluation index system for teaching staff construction	Optimization of Teacher Structure	Optimization status of age structure
		Optimization status of academic structure
		Optimization status of professional title structure
		Optimization status of knowledge Structure
	teacher assessment system	Scientific nature
		Fairness
		Perfection
		Humanize
	"Double-qualified" teachers competency characteristics	Teaching work status
		State of scientific research
		Practical ability status
		Teacher's morality and style
	Professional Construction and Teaching Reform	Training program reform
		Teaching method and content reform
		Curriculum Reform

Source: Prepared by the author

The meaning of each indicator in the table is as follows: the indicators included in the "Optimization of Teacher Structure" section are mainly used to evaluate the optimization level of teacher structure, mainly including four indicators: age structure, education structure, professional title structure, and knowledge structure. Among them, the age structure refers to whether the age of teachers in the institution has reached a reasonable ratio of old, middle-aged and young after the evaluation of the construction of the teaching staff, that is, whether the age structure has been optimized. Educational

structure refers to whether the academic qualifications of the institution's teachers have reached a reasonable ratio of undergraduate and master's degrees, that is, whether the educational structure has been optimized. The professional title structure refers to whether the professional titles of the institution's teachers have reached a reasonable ratio of low-level, intermediate, and high-level professional titles after the evaluation of the construction of the teaching staff, that is, whether the professional title structure has been optimized. The knowledge structure refers to whether the knowledge structure of the teachers in the institution has reached a state of reasonable complementarity after the evaluation of the construction of the teaching staff, that is, whether the knowledge structure has been optimized.

The indicators contained in the "Teacher Assessment System" part are mainly used to evaluate the achievements of the teacher assessment system, including four indicators: the scientific nature of the teacher assessment system, the fairness of the teacher assessment system, the perfection 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 the teacher assessment system treats all the teachers being assessed equally. The perfection of the teacher assessment system refers to whether the teacher assessment system is comprehensive and effective. The humanization of the teacher assessment system refers to whether the teacher assessment system is accepted by the majority of teachers.

The indicators included in the "Double-qualified teachers competency characteristics" part are mainly used to evaluate the effect of the construction of the teaching staff on the construction of "double-qualified" teachers, mainly including four indicators: teaching work status, scientific research status, practical ability status, and teacher morality status. Among them, the teaching work status mainly includes: the number of classes, the number of class hours, the number of students supervised, the number of teaching projects, the number of teaching achievement awards, the teaching evaluation effect of the reform, and the application effect. The status of scientific

research mainly includes: project level and funding amount, academic paper level and number, publication of monographs, patent applications, national awards, and provincial and ministerial awards, etc. The status of practical ability mainly includes: cognition of one's own position, the number and level of vocational training attended, the time and experience of working in enterprises, and the organization, coordination and management ability of practical teaching. The status of teachers' morality and ethics mainly includes: abiding by the standards of academic ethics, professional ethics and spirit, teaching attitude, etc.

Professional construction and teaching reform mainly refer to the reform of talent training programs, reform of teaching methods and content, and reform of curriculum system. Among them, the reform of the talent training program is mainly manifested in the training objectives and professional orientation, the "three innovations" (innovation, creation, entrepreneurship) education situation, and the quality education situation. The reform of teaching methods and content is mainly manifested in improving students' innovative ability, heuristic teaching, participatory teaching, and cultivating students' thinking mode. At the same time, the reform of teaching content includes two aspects: the reform of theoretical teaching content and the reform of time teaching. Curriculum system reform mainly refers to the innovative concept of curriculum system, the richness of curriculum content, the operability, flexibility and practicality of curriculum system, etc.

After determining the evaluation indicator system, we need to determine the weight of each indicator in this indicator system. The commonly used analysis methods mainly include subjective experience method, entropy method, Fuzzy clustering analysis method, Delphi method method and analytic hierarchy process. Although the first two are very simple to operate, they have strong subjectivity, high arbitrariness, low accuracy, and the accuracy of result evaluation is not ideal enough, often unable to reasonably reflect the relative importance of evaluation indicators. Compared with the entropy method and Fuzzy clustering analysis method, the Delphi method method and the analytic hierarchy process have the advantage that the first two methods do not need to use sample data, and experts can make judgments only by

understanding the evaluation indicators based on their personal knowledge and experience. Therefore, they are relatively widely used, especially suitable for evaluating some qualitative indicators. It should be pointed out that although the scope of application of the analytic hierarchy process is similar to that of the Delphi method method, the analytical logic of the analytic hierarchy process on the relative importance of indicators is stronger and the description is more detailed, and more mathematical (such as matrix) processing is added to improve the credibility of its results (Wang., 2006). Due to the combination of qualitative and quantitative analysis in the Analytic Hierarchy Process (AHP), which involves a lot of mathematical processing in evaluating the importance of indicators, it is more logical and scientific, and has a relatively high credibility. Therefore, after careful consideration, this study chose the Analytic Hierarchy Process (AHP) for indicator weight assignment.

Based on the Analytic Hierarchy Process (AHP) research, an evaluation system is usually constructed first, followed by the use of AHP to determine indicator weights, and finally a comprehensive score ranking is given (Ma., 2018). The determination of the weight of evaluation indicators at a certain level usually involves a pairwise comparison of the importance of evaluation indicators by experts, and the comparison results are presented in a matrix format. The matrix operation process can be performed manually or with the help of computer software such as MATLAB (Liu., 2007). The use of Analytic Hierarchy Process to determine the weight of evaluation indicators usually requires five steps of operation, which are: hierarchical hierarchical structure model construction, comparative judgment matrix construction, relative weight calculation of indicators, consistency testing of hierarchical sequences, and weight determination (Shi., 2020).

1. Constructing a hierarchical structure model. In the process of using Analytic Hierarchy Process, it is first necessary to systematically and hierarchically process the various factors evaluated, dividing them into several groups according to their attributes, and forming different levels based on their dominance and membership relationships. Usually, the factors in the previous layer serve as guidelines to govern the factors in the next layer. When dealing with systematic hierarchical processing, the

decision objectives, factors considered (decision criteria), and decision objects are usually divided into the highest, middle, and lowest levels based on their interrelationships. A hierarchical structure diagram is drawn in the form of a block diagram to display the hierarchical hierarchy of factors and illustrate the membership relationships between factors. The highest level refers to the purpose of the decision and the problem to be solved. The lowest level refers to various alternative solutions during decision-making. The middle layer, also known as the criterion layer, refers to the factors considered and the criteria for decision-making. For the adjacent two layers, the upper layer is called the target layer, and the lower layer is called the factor layer. (See Figure 1.4)

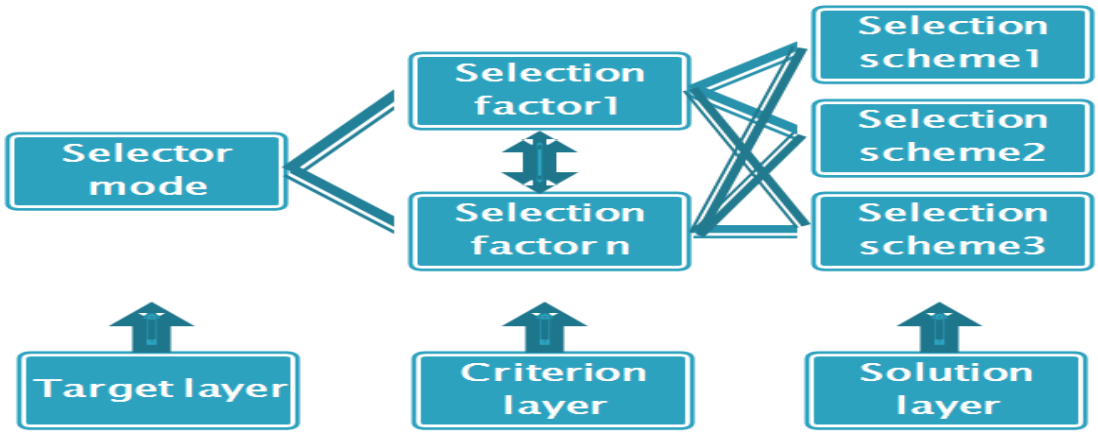

Figure 1.4- Hierarchical Hierarchy Model

Source: Prepared by the author

2. Compare and judge matrix construction. The second step of Analytic Hierarchy Process is to compare the elements of the same level in pairs, evaluate their relative importance regarding a certain criterion of the previous level, and construct a judgment matrix for pairwise comparison. Pairwise comparison is different from comparing all factors together as a whole. The former uses a relative scale to minimize the difficulty of comparing factors with different properties and improve the accuracy of evaluation. The values of each factor in the judgment matrix reflect the evaluator's understanding

of the relative importance of each scheme (factor) under it based on a certain criterion, which is a hierarchical evaluation of importance. To construct a judgment matrix, the 1-9 and its reciprocal scaling method proposed by Thomas L. Saaty is usually used (as shown in Table 1.6).

Table 1.6- Saaty Indicator Relative Importance 1-9 Scale Method

Indicator A compared to indicator B	Scale
Extremely important	9
Especially important	7
Obviously important	5
Slightly important	3
Be of equal importance	1
Slightly unimportant	1/3
Obviously unimportant	1/5
Especially unimportant	1/7
Extremely unimportant	1/9
Adjacent judgment median	2,4,6,8,1/2,1/4,1/6,1/8

Source: Prepared by the author

Assuming the number of indicators is 4, the pairwise comparison judgment matrix constructed for any 4 uncertain named indicators is shown in Table 1.7:

Table 1.7- Judgment matrix for any 4 indicators.

Indicator	Indicator 1	Indicator 2	Indicator 3	Indicator 4
Indicator 1	A11	A12	A13	A14
Indicator 2	A21	A22	A23	A24
Indicator 3	A31	A32	A33	A34
Indicator 4	A41	A42	A43	A44

Source: Prepared by the author

Referring to Table 1.5, the Saaty 1-9 scale method shown in Table 1.6 was used to construct the judgment matrix for the four first level evaluation indicators in this study. Next, several experts in the construction of the teaching staff can be invited to

compare and score indicators of the same level in pairs based on the existing indicator system and Saaty's relative importance scale. Finally, the collected questionnaire can be processed using Analytic Hierarchy Process software to obtain a judgment matrix and relative importance level. Table 1.7 presents the assignment of judgment matrices by one of the experts for the four first level indicators in this study.

Table 1.8- First-level indicator judgment matrix.

Category	Basic abilities and qualities	Teaching ability and quality	Scientific research ability and quality	social influence
Basic abilities and qualities	1	1/2	1/4	2
Teaching ability and quality	2	1	1/2	4
Scientific research ability and quality	4	5	1	8
social influence	1/2	1/4	1/8	1

Source: Prepared by the author

The judgment matrix structure in Table 1.7 can be expressed in matrix form as follows:

$$P=\begin{bmatrix} 1 & 1/2 & 1/4 & 2 \\ 2 & 1 & 1/2 & 4 \\ 4 & 2 & 1 & 8 \\ 1/2 & 1/4 & 1/8 & 1 \end{bmatrix}$$

3. To calculate the weight of the evaluation index, it is necessary to first use the square root method to calculate the characteristic (priority) vector of the judgment matrix. The calculation steps are as follows: First, calculate the priority vector of each element of the matrix P. Matrix P is a fourth-order matrix, and the fourth root of the product of elements in each row of the matrix is calculated as follows:

$$\sqrt[4]{1 \times \frac{1}{2} \times \frac{1}{4} \times 2}=0.7071$$

$$\sqrt[4]{2 \times 1 \times \left(\frac{1}{2}\right) \times 4}=1.4142$$

$$\sqrt[4]{4 \times 2 \times 1 \times 8} = 1.9343$$

$$\sqrt[4]{\left(\frac{1}{2}\right) \times \left(\frac{1}{4}\right) \times \left(\frac{1}{8}\right) \times 1} = 0.3535$$

From the above calculation, it can be concluded that:

$$W' = \begin{bmatrix} 0.7071 \\ 1.4142 \\ 1.9343 \\ 0.3535 \end{bmatrix}$$

Here, the sum of the four values 0.7071, 1.4142, 1.934, and 0.3535 is not equal to 1, making it impossible to compare them. Normalization is necessary to add these four values together in order to compare them with each other. By normalizing the data, we can obtain the feature (priority) vector W of basic competence, teaching competence, scientific research competence, and social influence.

W=［0.160 4，0.320 7，0.438 7，0.080 2］

Now, the relative weight calculation assigned by an expert to the four indicators has been completed.

4. Consistency check of hierarchical sequence. Due to the possibility of certain errors in the judgment matrix formed by expert scoring for pairwise comparison, it is necessary to conduct consistency ratio testing of hierarchical sequences. This test needs to be conducted based on the maximum eigenvalue of the judgment matrix constructed by four first level indicators. Only when the consistency ratio CR value is less than 0.1 can it be determined that the consistency of the matrix is satisfactory, thus the weights given by experts to the four indicators are reasonable; On the contrary, it indicates that the judgment matrix has a large error and needs to be reconstructed until the consistency ratio CR value is less than 0.1. The inspection formula is:

$$CR=\frac{CI}{RI} \qquad (1.1)$$

In formula 1.1, CI is the consistency index, and its calculation formula is:

$$CI=\frac{\lambda_{max}-n}{n-1} \qquad (1.2)$$

In formula 1.2, λ_{max} is the maximum eigenvalue of the judgment matrix, and its calculation formula is:

$$\lambda_{max}=\frac{1}{n}\sum_{i=1}^{n}\frac{(PW')i}{Wi} \qquad (1.3)$$

In formula 1.3, (PW ') i represents the i-th element of the vector PW'; RI is the average random consistency indicator of a multi order judgment matrix, and its value varies with the number of indicators (Zhang., 2020). Please refer to Table 1.9 for details.

Table 1.9- Multi order judgment matrix RI value.

Matrix order n	1	2	3	4	5	6	7	8	9	10
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

Source: Prepared by the author

The inspection is as follows:

Because $PW'=\begin{bmatrix}1 & 1/2 & 1/4 & 2\\ 2 & 1 & 1/2 & 4\\ 4 & 2 & 1 & 8\\ 1/2 & 1/4 & 1/8 & 1\end{bmatrix}\begin{bmatrix}0.7071\\ 1.4142\\ 1.9343\\ 0.3535\end{bmatrix}=\begin{bmatrix}2.6049\\ 5.2098\\ 10.4195\\ 1.3023\end{bmatrix}$

So the maximum characteristic root is: $\lambda_{max}=1/4$

（2.6049/0.7071+5.2098/1.4142+10.4195/1.9343+1.3023/0.3535）=4.1096

$CI=\frac{4.1096-4}{4-1}=0.0365$，$CR=\frac{0.0365}{0.90}=0.0406<0.1$

From the above, it can be seen that the average random consistency ratio CR of the judgment matrix is 0.0406, which is much less than 0.1. Therefore, it can be considered that the construction of the judgment matrix is effective and the allocation of weights is reasonable.

The above is the calculation method for the weight of primary indicators based on the research results of an expert. Of course, in practical applications, judgment matrices constructed by multiple experts should be selected and consistency checked on the judgment matrices constructed by these experts.

5. Weight allocation. When the consistency of the judgment matrices provided by these experts is all qualified, it indicates that the consistency of the judgment matrix is satisfactory, the weight allocation is reasonable, and the evaluation result is effective. Then, by averaging the weights of the first level indicators given by these experts, the final first level indicator weights can be obtained.

Subsequently, for the weights of the secondary and tertiary indicators, the above methods are used to calculate and obtain the final weight assignment, in order to start the subsequent evaluation work.

Conclusions to section 1

In the first section, this study focuses on the theory and methodological principles of modern vocational education personnel management, and explores the systematic methods and innovations of human resource management in vocational education institutions. The main content includes:

1. Under market conditions, the development of vocational education institutions pays more attention to connotation based development, adheres to quality construction as the center, and constructs a new pattern of sustainable modern vocational education system, presenting a new trend of cluster development. Pursuing the development of the connotation of vocational education should be the main task of vocational education institutions for a considerable period of time in the future. In the future, we should establish a vocational qualification and standard system that is guided by learning outcomes, aimed at serving market demand, required to connect academic

qualifications, reflecting the growth attributes of technical and skilled talents, and highly socially recognized. We should adopt a multi-level and multi-dimensional development model, starting from strengthening overall correlation, enhancing collaborative development, and deepening integrated governance, Promote the construction of the vocational continuing education system as a "first mover".

2. In order to meet the demand for skilled talents in future society and promote sustained economic growth, countries around the world have increased investment in the development of vocational education, continuously improving the favorable environment for the development of vocational education, and promoting the cultivation of technical and skilled talents. At the same time, countries around the world continue to introduce new laws and regulations to promote the development of vocational education, carry out green transformation, further improve and develop the construction of vocational education regulations, promote the transformation and upgrading of the economy, energy, and industrial structure, and achieve sustainable economic and social development.

3. The exploration of internet-based vocational education teaching models will further accelerate the process of digital and information technology reform in global vocational education, with a greater emphasis on international cooperation and exchange. Countries around the world encourage cross-border exchanges in the field of vocational education, providing a broad platform for vocational education institutions to exchange and learn from each other. According to changes in market conditions, strengthening the integration of industry and education, and through continuous targeted reforms, aligning the development of vocational education with market demand, is driving the level of vocational education forward.

4. Countries around the world are actively improving the certification mechanism for vocational education achievements, encouraging vocational college students and various in-service personnel to obtain vocational qualification certificates through vocational skills education, in order to better match the technical skills needs of the workplace. By building a lifelong vocational skills training platform, the concept of lifelong development of vocational education and training has been continuously

promoted, emphasizing the construction of a learning society, which is an important development direction for the education and teaching work of vocational education institutions in the future.

5. Rural vocational education will be fully valued and developed. In addition, according to the market demand of different regions, professional setting argumentation organizations are established to conduct argumentation and review of professional settings, optimize the layout of professional development, and propose regional professional setting plans through macro regulation and homogenization. Reasonable control of the number of professional points and enrollment scale is required, and continuous optimization of talent cultivation direction is carried out to promote the continuous development of the economy and society.

6. By drawing on the experiences of developed vocational education countries such as Switzerland, Finland, New Zealand, Germany, Belgium, Denmark, Chile, Australia, Luxembourg, and France, Chinese vocational education has made breakthroughs in recent years. Advanced vocational education concepts such as the dual system vocational education model and the parallel strategy of general education and vocational education have been widely promoted and innovatively applied.

7. Combining fuzzy mathematics with Analytic Hierarchy Process, based on the principles of fuzzy mathematics, using fuzzy operation rules to quantify fuzzy factors, innovatively using fuzzy mathematics methods for comprehensive evaluation of teacher team construction, and designing relevant indicator systems.

8. A hierarchical hierarchical structure model based on Analytic Hierarchy Process is constructed, using the 1-9 and reciprocal scaling method proposed by Thomas L. Saaty to construct a judgment matrix. Then, the root method is used to calculate the eigenvectors of the judgment matrix, and the weights are obtained after normalization. After verifying the consistency of this weight hierarchy sequence, the final weight assignment of the indicator is determined.

SECTION 2.
CURRENT SITUATION OF PERSONNEL MANAGEMENT PRACTICE IN VOCATIONAL EDUCATION IN CHINA

2.1 The current situation and development trends of personnel management in vocaational educational institutions in China

Personnel management is the core of the management of higher vocational education institutions and the foundation of all other work. Its central task is to manage six major sections of the school's human resource planning, recruitment and allocation, training and development, performance management, salary and welfare management, and labor relations management.(See Figure 2.1) Only through reasonable allocation of human resources and maximizing their advantages in their respective positions can employees' enthusiasm be enhanced, thereby promoting the development of other internal work within the institutions.(Li., 2015) Therefore, establishing and improving a complete set of personnel management workflows in higher vocational colleges is a long-term and urgent task that must be achieved through practical efforts from multiple aspects.

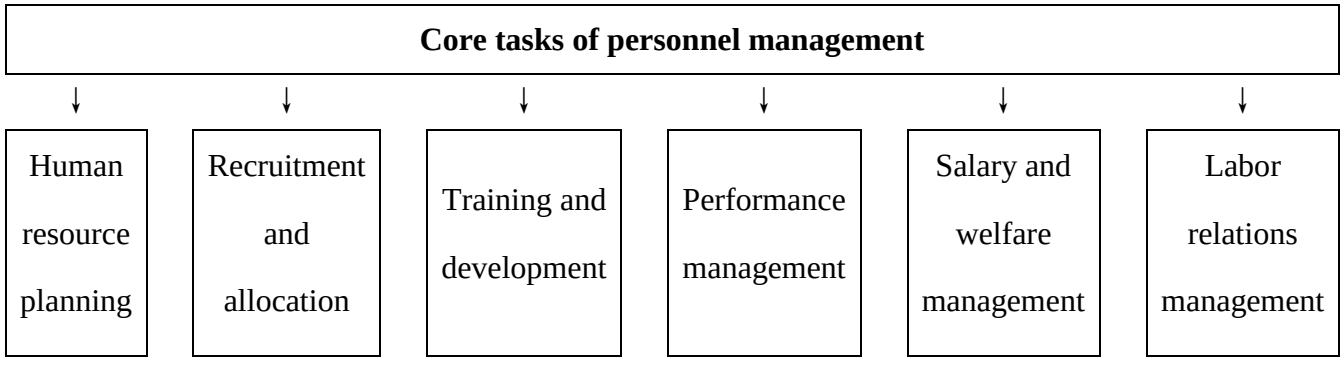

Figure 2.1- 6 core tasks of personnel management.

Source: Prepared by the author

Currently, the personnel management of higher vocational education institutions

in China is led by the Party committee of the institution and implemented by the Personnel Department. The personnel department of most units and the Party Committee Teacher Work Department work together to ensure that all aspects of personnel management and teaching process comply with the correct ideological ideology.

With the reform and development of higher vocational education institutions, China's higher vocational education institutions have entered the period of the "Double High Plan". The focus of the "Double High Plan" is to "lead reform, support development, and showcase China's characteristics"; The "world-class" higher vocational education is an important measure for China to continuously deepen reform and achieve high-quality development, as well as an important measure for achieving modernization of higher education. In order to meet the development needs of higher vocational education institutions in the new situation, personnel management personnel in China's higher vocational education institutions closely follow the needs of teaching, scientific research, and administrative management. They adopt open recruitment and targeted transfer in talent selection, select suitable talents within a certain range, and allocate various staff's work to various positions based on job needs and job nature, Maximize its advantages.(Yang., 2023) Personnel management workers, based on the current development trend and requirements for human resources, provide various political, business, and professional ethics training to institutional staff to continuously improve their work level. In the assessment and evaluation process of employees, classify the work characteristics of teachers, management personnel, and teaching assistants based on their work characteristics; By designing a scientific and reasonable performance evaluation system and establishing an evaluation system for performance evaluation, personnel with equal job attributes can participate in the work, thus achieving good competition. Personnel management personnel are also responsible for providing corresponding compensation and bonuses to employees based on their basic qualities, as well as annual assessments and assessment results, in order to achieve the goal of "rewarding and punishing the fittest".(Xue., 2020)

The significance of personnel management in higher vocational education institutions in China lies in maximizing the allocation of human resources, exerting the role of human resources, and promoting the sustained growth of talents. By selecting and recruiting outstanding talents in a reasonable manner, and assigning these talents to corresponding job positions. Personnel management provides conditions for talent growth and development, and relevant incentive policies are formulated. Through training, education, further education, and other means, the comprehensive quality of existing staff is continuously improved, effectively unleashing their talents. The vast majority of personnel management workers in institutions have also established a fair and just work assessment system based on different dimensions, in order to maximize the motivation of employees and encourage them to play the maximum role in the most suitable work environment. The personnel management work of higher vocational education institutions is the most important component of the talent team construction work of this institution. It is of great significance for the institution to cultivate excellent technical and skilled talents, and plays a decisive role in improving the overall educational strength and quality of this institution.

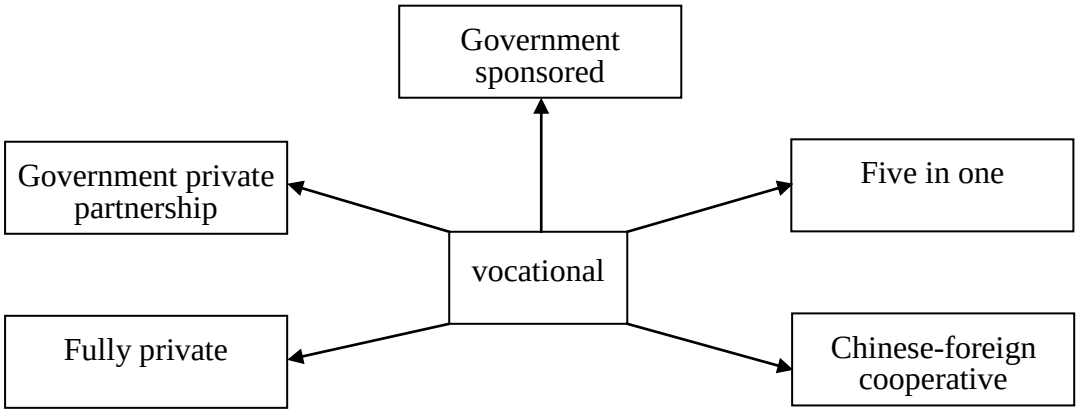

Figure 2.2- The Forms of Higher Vocational Education in China.

Source: Prepared by the author

At present, the form of holding higher vocational education institutions in China is still mainly held by the government. In addition to government-organized programs, there are state-owned private systems, completely private systems, five-in-one holding

forms (base joint construction, enrollment collaboration, teaching interaction, scientific research integration, and win-win employment), and Chinese-foreign cooperation. (See Figure 2.2) (Qiu., 2010) Vocational education institutions have different characteristics in their personnel management under different forms of organization. Since China's higher vocational education institutions are mainly organized by the government, the discussion in this article is also aimed at this most widely covered and most common form of government-organized.

Institutions organized by the government and involving vocational education are referred to as "public institutions" in China. The government has strict control mechanisms over the employment of public institutions, so vocational education institutions established by the government have significant constraints on the autonomy of employment. Due to the existence of such restrictions, the excellent talents required by vocational education institutions cannot achieve efficient flow, and the internal competition mechanism for talents is difficult to form. Often, the desired excellent talents cannot enter, and mediocre performers cannot flow out. Most higher vocational education institutions only focus on superficial measures in talent management. Due to institutional limitations, there is a lack of mechanisms for introducing and retaining talents, as well as establishing a favorable environment suitable for their individual development and realizing their life values. This has formed the fundamental reason why higher vocational education institutions have long been bloated, overcrowded, procrastinated in handling affairs, slow in decision-making, wrangling with each other, and low in administrative efficiency. A survey in July 2023 on the participation of teachers in teaching reform projects in vocational education institutions across the country showed that 75.80% of teachers had not participated in teaching reform projects at the prefectural or municipal level or above, 14.49% of teachers had participated in one project, and 4.94% of teachers had Participated in 2 projects, 1.76% of teachers participated in 3 projects, and 3.01% of teachers participated in 4 projects or more. This shows that there is still a lot of room for improvement in the talent growth atmosphere of vocational colleges. (See Figure 2.3)

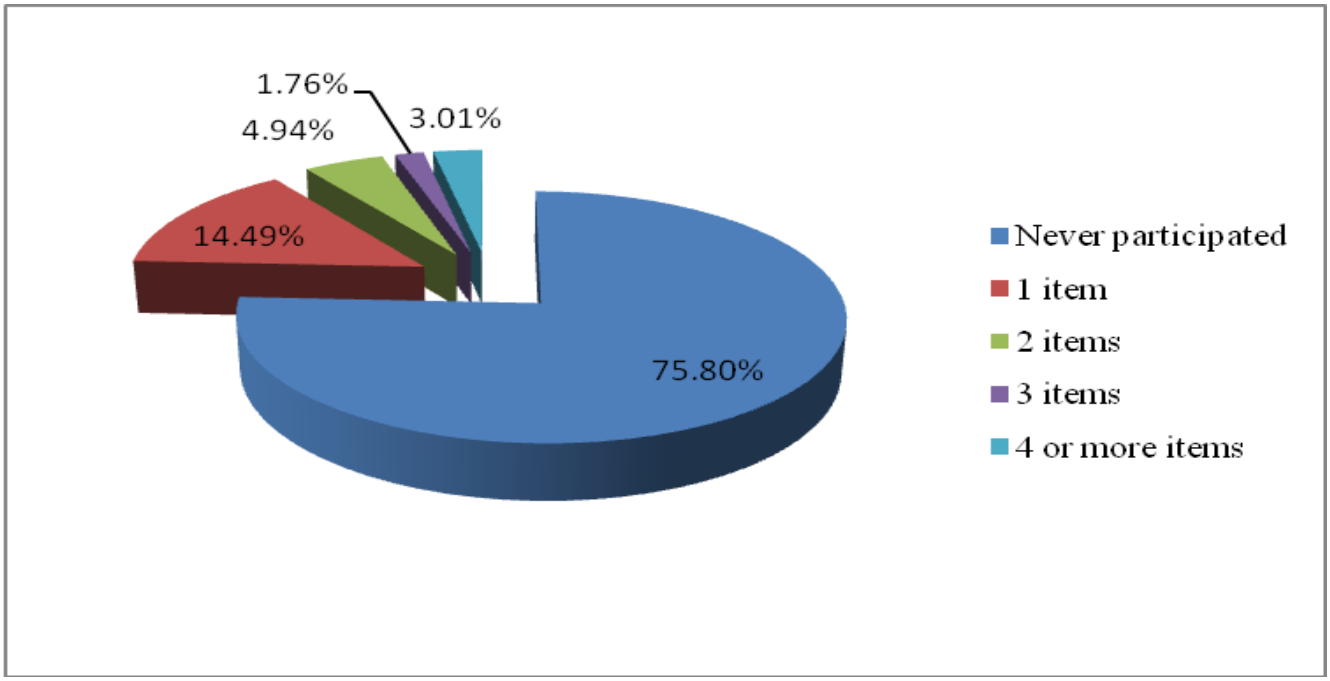

Figure 2.3- Teachers' participation in teaching reform projects in China's vocational education institutions.

Source: Prepared by China Education Online

The personnel management of higher vocational education institutions in China is mostly arranged and arranged according to the management concept of "putting things first". This is because, influenced by the traditional planned economy system, personnel managers only follow the management model formulated by the state, and rarely can develop corresponding management mechanisms based on the actual situation of their own institutions. Moreover, personnel management activities are prone to external human interference, and the transparency of management work is not high. Specifically, in terms of the behavioral process, the management process tends to emphasize things while neglecting people. Management work is only trapped in trivial daily affairs, and managers only implement relevant regulations stipulated by the superior department or their own department. It is a passive management rather than proactive development management. Neglecting research on the development of higher vocational education, learning policy theories, and exploring personnel system reform. In addition, due to the constraints of the comprehensive quality of personnel management workers themselves, their pioneering and innovative performance in

personnel management work is also insufficient. In their daily management, they paid attention to administrative management, ignored the principle of Democratic centralism, and failed to fully pay attention to the needs of the development of the organization for personnel management, thus only mechanically and rigidly implementing the system.

At present, the composition of human resources in most higher vocational education institutions in China is not entirely reasonable. At present, higher vocational education institutions are basically established based on three parts: management personnel, workers, and professional and technical personnel. From the perspective of human resources, the key to the development of vocational colleges is the professional and technical personnel team and management personnel team. In the overall personnel structure of most vocational colleges, the proportion of teaching and research personnel is seriously insufficient, while the proportion of other non teaching personnel is too large, which to some extent hinders the development of education and research in the school, and also hinders the fundamental connotation development of the school. Secondly, the structure of various personnel within higher vocational education institutions is also not entirely reasonable. Especially in the teaching and research team, most teachers can only provide general courses and impart knowledge, lacking authoritative planning and coordination of overall teaching and research by master level leaders. Finally, among management personnel, most managers only carry out general daily work operations, lacking updates on modern management ideas, improvement of management abilities, and high personal qualities. This imbalance in the proportion of human resources structure seriously hinders the efficient management of human resources by higher vocational education institutions, and limits their rapid development.

The personnel management system of higher vocational education institutions in China lacks scientific innovation. In China, the personnel management system of most higher vocational education institutions still manages according to identity, neglecting job awareness. Because of the Life tenure system of professional titles and positions, many people are satisfied with the status quo after they are awarded professional titles

or promoted positions, and are no longer interested in the improvement of business level and the innovation of quality and ability. Many teachers have developed a sense of satisfaction after being rated as professors, simply believing that it is "the end" and no longer pursuing the improvement of teaching quality and research ability; Some cadres remain complacent after being promoted and appointed. Although they are highly regarded by leaders for a while, they lack exploration and innovation in their work, which affects the quality and efficiency of vocational education management. Judging from the national patents obtained by teachers in vocational education institutions, 88.03% of teachers have never obtained a national patent, 6.73% of teachers have obtained 1 national patent, 2.65% of teachers have obtained 2 national patents, and 1.13% of teachers have obtained 3 national patents have been obtained, and 1.46% of teachers have obtained 4 or more national patents. This shows that the achievements of the vast majority of teachers in scientific research and innovation are not ideal. (See Figure 2.4)

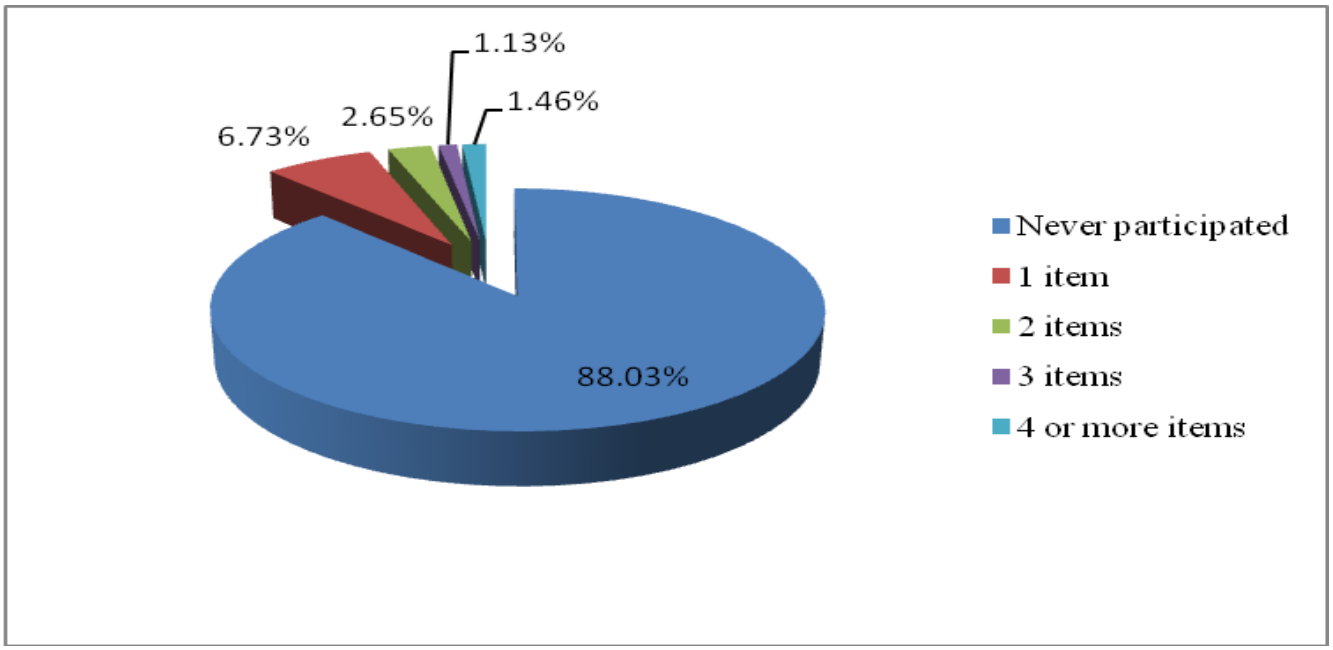

Figure 2.4- Status of national patents obtained by teachers in Chinese vocational education institutions.

Source: Prepared by China Education Online

At present, the informationization of personnel management in most higher

vocational education institutions in China is still in its early stages, and these institutions have only undergone informationization transformation in personnel data. Through in-depth understanding of personnel management work in different higher vocational colleges, we can draw the following conclusion: at present, the informatization of personnel management in most institutions is still in the stage of data preparation, the informatization construction of personnel management is basically at the beginning of this step, and the development requirements of Paperless office, informatization and normalization of personnel management have not been realized. At the same time, intelligent analysis and research of personnel information and making corresponding decisions have not yet been truly realized, and decision-making in personnel work still needs to be completed with the help of personnel experts.(Wang., 2015) At present, personnel information management still lacks a shared and unified management form, which not only makes it difficult to recycle most of the information, but also makes it difficult to improve personnel management level. In work practice, the management planning standards are not unified, making it difficult for our institution's personnel management information to be efficiently communicated and used with other institutions.(Zhang., 2021)

The personnel management of higher vocational education institutions should establish a "people-oriented" management concept. Modern personnel management should be centered around human management, with motivating people's behavior and motivating their enthusiasm as the foundation, truly achieving the best of their abilities and enabling them to complete work tasks to the best of their abilities. The personnel work of higher vocational education institutions should also transform the traditional management approach into a human resource management approach that focuses on the development and utilization of existing human resources, the reorganization and improvement of human resources, the reasonable combination of institutions manpower and the scientific arrangement of institutions manpower, forming the optimal overall personnel structure, and maximizing the educational, scientific, and social benefits of school management. In addition, Chinese higher vocational education institutions have accumulated certain experience in personnel management

work, and some institutions have formed relatively fixed work models. However, due to the continuous development of China's education industry, the previous work models were difficult to meet the needs of the times, which had a significant impact on the management of vocational education institutions. Therefore, it is necessary to change the management philosophy and improve the quality of work. Firstly, personnel engaged in personnel management need to change their mindset, pay more attention to personnel management work, ensure the orderly development of personnel management work, and invest more resources and funds to promote the systematic construction of personnel work. Secondly, in the past, some personnel management personnel adopted a relatively backward management model, often adopting rigid management and strictly limiting employee behavior, resulting in low satisfaction of teaching staff with personnel management work. Therefore, when carrying out personnel management work, it is necessary to pay attention to the feelings of employees, regularly collect their opinions, provide suitable work platforms based on their needs, and ensure that they can carry out work in suitable positions. This can not only improve the quality of work, but also enhance the sense of belonging of faculty and avoid talent loss issues.

After analyzing the characteristics and connotations of the people-oriented concept, it was found that the core of the people-oriented concept is to respect the individual and affirm their value on the basis of exploring their potential. Therefore, when carrying out personnel management work in higher vocational education institutions, the formulation of all systems and the establishment of systems should be based on respect. For example, personnel management work must emphasize fairness and justice, clear rewards and punishments, and not be biased due to any factors. However, while strictly emphasizing the system, it should also have a certain degree of flexibility. The system should reflect humanistic sentiments and also provide care for the specific situations of certain employees. Through the implementation of a flexible system, it reflects the respect for people in the personnel management system, and this system can also fully mobilize the enthusiasm of employees, create a sense of

identification with the unit, and promote the efficient implementation of personnel management work.(See Figure 2.5)

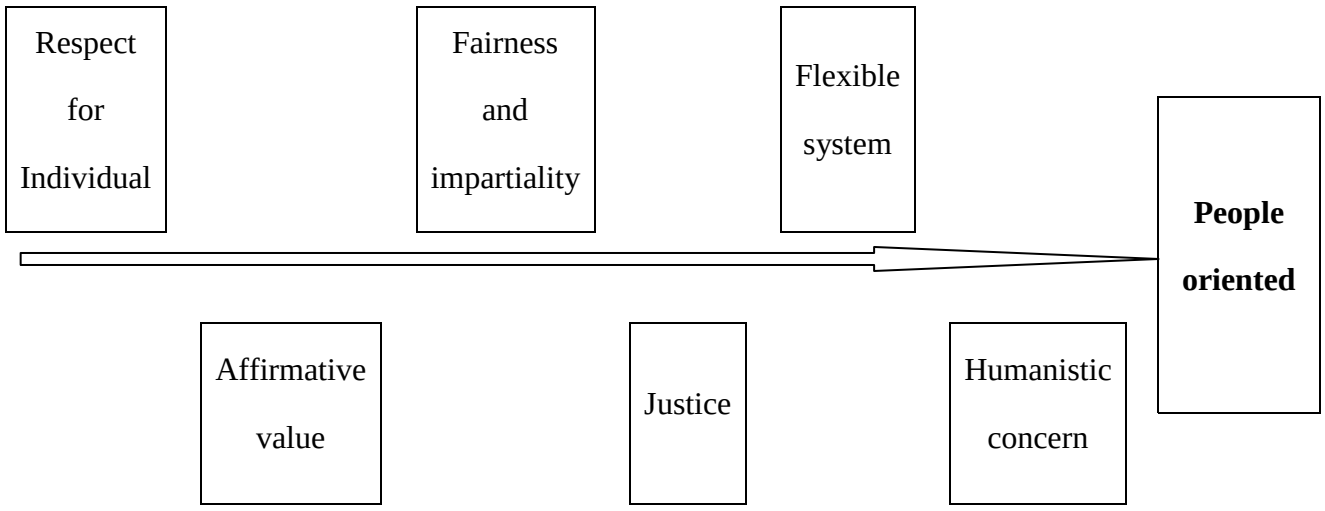

Figure 2.5- The people-oriented concept of personnel management.

Source: Prepared by the author

Motivation can have a positive impact on people's thinking and behavior. Therefore, under the people-oriented concept, personnel management in higher vocational education institutions must use motivation as a means. If a person receives frequent praise, their self-confidence will greatly improve, which is conducive to mobilizing their work enthusiasm, enhancing their abilities, and fully realizing their own value. Under the humanistic theory, vocational colleges use motivation as a means to carry out personnel management work, which can fully tap into the subjective initiative of employees, stimulate their potential abilities, and improve their ideological awareness to face their work in a more fulfilling state. This not only allows personnel management work to proceed smoothly, but also unleashes employees' self-worth.

Under the people-oriented concept, the personnel management work of higher vocational education institutions emphasizes ability. Simply put, it is to stimulate employees' work enthusiasm and initiative, unleash their maximum potential, and continuously enhance their own value. In specific personnel management work, it is

necessary to motivate employees' abilities as the foundation, and develop management plans and implement management measures based on this. In the implementation of personnel management work in higher vocational education institutions, the ability to stimulate employees should always be given top priority, and all management systems and measures should be taken as the center (Huang., 2021).

The personnel management work needs to further optimize the personnel management structure. In the personnel management of higher vocational education institutions, if only each member of the personnel management cadre is emphasized with clear responsibilities, then it is not enough to maximize the enthusiasm and creativity of the teaching staff. It must be combined with the adjustment and optimization of the entire institution in order to further optimize the personnel management structure of the institution. As an institution itself, in order to achieve its overall goals, it must rely on the coordination of management personnel, professional technical personnel, and workers. Therefore, in order to maximize the functionality of personnel management, it is necessary to optimize the proportion structure of these three types of employees. On the premise of maintaining a relatively stable team of management personnel and workers in the institution, it is necessary to conduct diversion, adjustment, and combination to ensure the overall quality improvement of the professional and technical personnel team, in order to leverage their individual and group advantages, in order to further enhance the vocational education level and strength of the institution.

There should be an innovative personnel management system. The first is the innovation of the employment system. To reform and innovate the employment system, higher vocational education institutions must establish a personnel management system that meets the requirements of social development and higher vocational education, realize the transformation of personnel management from fixed employment to contract employment, from Identity management management to post management, and from administrative management to market legalized management. Clarify job responsibilities and qualifications, and hire suitable individuals to suitable positions through open competition. Secondly, we need to innovate the talent

introduction system. Starting from the actual situation of higher vocational education institutions themselves, we should continuously expand the channels for introducing talents, in order to select talents at all levels that are more suitable for our own development. By strengthening the cultivation of talent teams, creating a good academic atmosphere, promoting the realization of personal value of talents, and building a high-quality talent team. Finally, it is necessary to innovate the distribution incentive system. We need to establish a distribution system that can attract and retain outstanding talents, motivate faculty to explore and innovate, fully tap into their own potential, and continuously improve work performance. The starting point of innovation in the distribution incentive system should be to mobilize the enthusiasm of employees, and the innovation point of the system is to establish a distribution mechanism that emphasizes performance, contribution, and is inclined towards high-level talents and key positions. We should combine the job appointment system to directly link the income of teaching staff with job responsibilities, work performance, and actual contributions, fully leverage the incentive function of wages and bonuses, and fully mobilize the enthusiasm of teaching staff.

Strengthen the informatization construction of personnel management. Firstly, it is necessary to accurately define the work content of personnel management informatization. In order to comprehensively carry out personnel management informatization work, it is necessary to systematically divide the responsibilities of internal management departments and scientifically define personnel management work according to different standards. Specifically, from the perspective of job nature, management information mainly includes salary information, basic personnel information, and employee performance information. From the perspective of management content, personnel management information mainly includes two categories: internal information and external information. Regardless of the classification criteria, this information is an important component of personnel management work in vocational colleges and an important part of personnel management informationization reform in vocational colleges. Work definition, work objectives and management standards shall be formulated, information shall be

classified and planned systematically and scientifically, and scientific information means shall be used to ensure the smooth development of personnel management. Secondly, we should attach importance to the construction of information technology in personnel management. Higher vocational education institutions should place this content at the strategic level of institutional development, guide management personnel to establish an awareness of active learning, and actively coordinate and integrate information technology with their own departmental work. At the same time, it is necessary to regard the construction of personnel management informatization as the driving force for the continuous development of various processes in the school, and from a strategic perspective, clarify the overall architecture of information systematization construction, and improve the professionalism of the system's functional design and business processes. Thirdly, we need to comprehensively promote the construction of information technology in personnel management. It is necessary to realize the full coverage of the informatization process from the early input of information to the daily submission and declaration of materials, as well as the teacher's performance appraisal, salary and welfare, professional title declaration, evaluation and employment management, and realize Paperless office office. Especially in the post pandemic era, the traditional human resource model has been completely broken, followed by the continuous promotion of intelligent and automated office work, strengthening measures such as process informatization, data informatization, remote office, and online collaboration. It can be seen that the gradual advancement of informatization has also led to continuous changes in human resource management in universities.（Wu., 2022）Fourthly, efforts should be made to build a "multi-party reuse" personnel management information platform. The construction of personnel management platforms in higher vocational education institutions needs to take into account the basic situation of employees, cooperation between schools and enterprises, and annual assessment of personnel work, in order to fully reflect the diverse, in-depth, and dynamic characteristics of personnel management work, in order to avoid the occurrence of information silos in traditional personnel management models and reduce functional overlap and low management efficiency among

departments. In the process of building a "multi-party reuse" personnel management information platform, relevant personnel first need to pay attention to the filling and declaration of relevant information, achieve "one-time filling, multi-party reuse", and carry out "comprehensive management, mutual recognition, and sharing" of various types of information. In addition, this personnel management information platform must also be able to achieve synchronous operation between PC and mobile phones, ensuring that the display, query, and input of various information can be synchronously uploaded and updated.

Continuously improving the comprehensive abilities of personnel management personnel is also an important aspect of improving the level of personnel management work in the future. Currently, most higher vocational education institutions in China lack professional personnel management staff, which directly affects the implementation of personnel management work and hinders the improvement of vocational education quality. Therefore, measures need to be taken to improve the comprehensive abilities of staff. Firstly, institutions should improve the level of recruitment of personnel management personnel by introducing highly educated and high-level personnel with certain work experience and expertise in personnel management. In terms of ability, they can quickly adapt to the working environment and requirements of personnel management in higher vocational education institutions. In recent years, due to the increasing popularity of computer technology in the management process, personnel management personnel are required to proficiently master the use of computer equipment, and even to comprehensively master advanced information technology in order to effectively improve work quality.

Pay attention to improving the quality of performance evaluation work. In the personnel management work of higher vocational education institutions in China, performance evaluation of employees is an important and difficult task. By conducting performance evaluations, we aim to continuously improve the quality of our employees' work and enhance our institution's competitiveness in the field of vocational education. However, there are a lot of problems in carrying out performance appraisal work, such as how to evaluate the workload generated by different positions?

How to evaluate the quality of different work carried out? How to quantify the workload generated by a specific or non specific task? To solve these problems, it is necessary to continuously improve the level of performance evaluation work, improve the performance evaluation system, and scientifically evaluate the overall work status of employees in a truthful and objective manner.(Chen., 2021)

Personalized salary design. The personnel management of higher vocational education should be based on the concept of interconnected teaching management, scientific research management, personnel management, and salary management, and establish a modern governance mechanism that integrates and promotes various modules. At the same time, a differentiated and market-oriented compensation mechanism should be established to replace a balanced compensation mechanism, so as to ensure that teachers engaged in higher vocational education can achieve the same salary level as those engaged in technology research and development, ensuring the stability of the teaching staff.

The average distribution of benefits and salary system will affect the income of teachers with high levels of internal research, strong academic production capacity, and good teaching effectiveness in institutions, thereby affecting their enthusiasm for teaching and research. The personnel management department of higher vocational education institutions should apply to their superiors to increase the overall level of basic salary rewards for teachers on campus, especially for teachers with high scientific research level and strong teaching ability. In addition to increasing the salary standards for teachers who have completed their own work in excess of and with high quality, the personnel management department should also actively explore personalized and diversified forms of salary and reward distribution.(Zhao., 2021) For example, according to the requirements of teacher team construction, actively explore the introduction of agreement salary system, annual salary system, and project salary system, further improve the internal salary and reward structure, and integrate humanistic care into the daily management of employees. Among them, the agreed salary system can be implemented in accordance with the special action of talent service organized by the Ministry of Human Resources and Social Security of the

Ministry of Human Resources and Social Security to promote the reform of the salary system, including three parts: performance bonus, post salary, allowance and subsidy. The labor remuneration needs to be determined based on the position, contribution, work ability and other conditions of the personnel through equal consultation between both parties. Generally, it is necessary to measure the salary level of the same category of faculty and staff files, and negotiate once a year. Each position has one type of salary and treatment, and the salary and treatment change with the change of the position. Under this assessment and evaluation model, the work enthusiasm and subjective initiative of grassroots faculty can be greatly improved. The annual salary system includes three parts: effective annual salary, basic annual salary, and bonus, and is a competitive salary and treatment model in the market. In this model, the annual benefit salary is mainly based on the completion of the annual task indicators assessed by the assessment department. The basic annual salary specifically refers to the basic salary of the post paid monthly. The bonus is mainly paid to the personnel who have exceeded the predetermined task indicators or made outstanding contributions. The project salary system is mainly aimed at temporary employment and flexible introduction of innovative talents who undertake phased tasks in major scientific research projects. During the project cycle, the total salary of the project is determined through consultation between the school and talent, and is regularly disbursed from the project funds and distributed based on the completion of work tasks. This model can further stimulate talent innovation and creativity. In addition, in order to retain outstanding talents and maintain their attractiveness, universities can provide different types of professional training for teachers based on the development of a personalized labor compensation system, and provide sufficient support for outstanding faculty members to go abroad for study visits, academic exchanges, and further education through research funds.

To improve the efficiency of personnel management. In order to improve the efficiency of personnel management work, higher vocational education institutions should first scientifically establish personnel management departments. Some vocational education institutions do not have a dedicated personnel management

department, which hinders the smooth implementation of personnel management work. Therefore, higher vocational education institutions must establish a dedicated personnel management department to ensure coordination and cooperation among various departments, and also give the personnel management department certain rights to fulfill corresponding obligations and responsibilities. Secondly, it is necessary to improve the comprehensive quality of personnel management personnel through training, lectures, and other forms. In order to provide a good development platform for the entire organization's employees, personnel management personnel must possess strong professional literacy. Therefore, the personnel management department should regularly organize training activities in both ideological and technical aspects. Ideological training should mainly focus on improving the ideological awareness of personnel management personnel, enabling them to recognize the importance of their own work, so that they can actively and efficiently complete their own work; Technical training mainly aims to impart some personnel management skills and methods to personnel management staff, enabling them to learn from successful cases and combine them with the actual situation of the organization to carry out personnel management.

2.2. Strategies for adapting China's vocational education to socio-economic development

With the accelerating development of global economic integration, specialized division of labor will become more refined. Although the current world economic situation has experienced certain fluctuations due to the impact of the epidemic, and the speed of China's economic development has gradually slowed down, China remains at the core of the world economic landscape and remains the region with the most innovative vitality and development potential. In 2022, China's GDP remained the second largest in the world and was the driving force behind global economic growth.(See Figure 2.6)

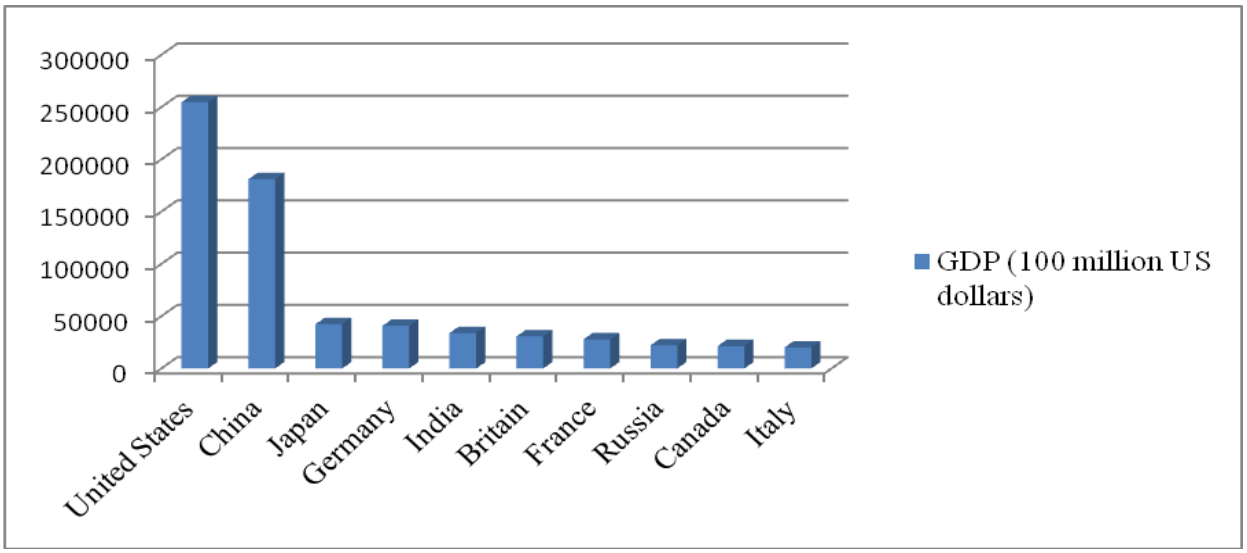

Figure 2.6-GDP Rankings of Major World Economies in 2022.(IMF)

Source: Data sourced from IMF

We know that the coordinated development of modern vocational education and the economy is not only an essential requirement for the attributes of vocational education, but also the practical application of the economic effects of vocational education. In the vast education system, vocational education cultivates labor, improves labor productivity, and promotes economic development. From this perspective, vocational education itself is an important element of economic development; At the same time, economic development also provides material security and financial support for vocational education, and there is an interactive relationship between them.

In the process of social and economic development, vocational education is one of the most closely related educational forms to economic development, with a wide range of marketability. Marketability is the basic industrial nature of the economic sector. Since the 18th National Congress of the CPC, it has emphasized that the market plays a decisive role in the allocation of resources, realizes the optimal allocation of resources through the market mechanism, and promotes the continuous development of the economy. Vocational education undoubtedly has a market-oriented nature, which is consistent with the market-oriented nature of economic development. It is an

inevitable result of the mutual influence and interaction between vocational education and economic development for a long time. Vocational education not only has a general industrial nature, but also has certain characteristics. The demand for vocational education is diverse. Vocational education not only has economic and industrial functions, but also political, cultural and other functions. Vocational education can not only meet individual needs but also showcase the commodity attributes of labor. Vocational education is market-oriented and cultivates professional talents who meet market demands; Vocational education has a certain degree of productivity. Vocational education is open and cultivates the talents needed for economic production. While conducting institutions teaching and production, it can also be combined with enterprises for corresponding production.

As is well known, vocational education can provide a wide range of human resources support for the economic and social development of a country, especially for a manufacturing country. It is necessary to attach great importance to the important role of technical and skilled talent cultivation in social and economic construction, emphasize that vocational education closely matches the needs of social and economic development, and undertake the task of cultivating technical and skilled talents through vocational education.(Vu., 2012) Due to the training of various technical and skilled talents in vocational education, these talents play a crucial role in various fields of social and economic development.(Liu., 2021) At present, the world economy has entered a new pattern of development, and industrial upgrading and economic structure adjustment are constantly accelerating. This has made the demand for technical and skilled talents in various industries increasingly urgent. Economic development requires a large number of talents with advanced technology and theoretical and design abilities.（See Table 2.1）

Only in this way can the development of industries keep up with the pace of world economic change.(Li., 2021) In such a transformation, vocational education has increasingly demonstrated its important role in economic development and progress, while also providing rare opportunities for the progress and development of vocational education.(Lee., 2020)

Table 2.1- Top 10 Most Urgent Skilled Talents in China in 2022.

Serial Number	Career Name	Career Definition
1	Marketing staff	Personnel engaged in market research, promotion of goods and services
2	Automobile production line operator	Personnel who operate and adjust production line equipment and fixtures for automotive painting, welding, stamping, machining, heat treatment, forging, casting, and processing automotive components.
3	Restaurant Attendant	Personnel who arrange customer seating, order side dishes, and provide banquet design, decoration, and decoration services in catering venues.
4	Turner	A person who operates a lathe to perform surface cutting of workpiece rotation.
5	Welder	Personnel who use welding machines or welding equipment to weld metal workpieces.
6	Machinery manufacturing	Engineering and technical personnel engaged in the research and development of mechanical manufacturing processes, process equipment, and production technology organizations
7	Assembly Worker	Personnel who use machinery, fixtures, and tools to assemble and debug mechanical equipment components, components, or finished product combinations.
8	Marketing management	Professional personnel engaged in market analysis, product promotion, production and operation decision-making consulting services
9	Electrician	Personnel who use tools, measuring tools, instruments, and meters to install, debug, maintain, and repair the electrical parts of mechanical equipment and electrical system circuits and components
10	Cast-on outwell	Personnel who operate equipment such as smelting and molding, mix molding materials, use instruments or tools such as weighing, temperature measurement, and composition detection to melt metal raw materials, and pour molten metal liquid into the mold to form castings

Source: Data sourced from China Employment Network

The fundamental task of vocational education is to provide sufficient human resources for economic development. The development of the economy cannot be separated from the support of human resources. Without human resources, the economy cannot develop. There is a close interrelationship between vocational education and economic development, and economic development continues to promote the further improvement of social productivity. In China, vocational education is based on "cultivating morality and talents", cultivating high-quality technical and skilled talents with a high sense of social responsibility, innovative spirit,

and practical ability. Vocational education cultivates and innovates human resources through systematic and standardized teaching, ensuring sufficient human resources to promote harmonious economic and social development. Good economic development also provides necessary material support and a favorable development environment for vocational education. Therefore, vocational education is beneficial for young people to access the door to success, cultivate more specialized talents, facilitate the inheritance of technical skills, and promote employment and entrepreneurship. Especially in the new era, during the critical period of national industrial transformation and development, economic development requires a large number of industrial workers with genuine talents and craftsmanship spirit. Therefore, the development of vocational education is more conducive to the upgrading of China's economy and talent cultivation.

The economic development of a region is inseparable from its production factor resources, educational resources, and market resources. As an important component of educational resources, vocational education undertakes the important division of labor in the practical application of theoretical knowledge, and is an important branch of education that teaches people the ability to ultimately transform resources into economic benefits.(Ifeanacho., 2018) In fact, we all know that in economically developed countries, vocational education must have a higher level. For example, Germany's "dual system" and action oriented vocational education curriculum model have made "Made in Germany" famous in the world, and promoted Economy of Germany's economic development in the first camp of the world economy. In addition, TAFE in Australia has promoted the development of vocational education. The government has constantly strengthened the macro-control of vocational education. Through Macromanagement and guidance, the development of vocational education can closely follow the pace of socio-economic development and coordinate economic development. In the UK, the BTEC teaching model also actively changes the management system of vocational education, enabling the coordinated development of the economy and vocational education, and adapting this development to the needs of the times, making it in line with the country's economic development characteristics

(Zhu et al., 2021).

In China, in order to adapt to the rapidly changing economic and industrial situation and better promote the development of the national economy, the government strongly supports the development of vocational education and has introduced numerous policies and measures to support the development of vocational education, emphasizing precise regulation and guidance of the operational mechanism of vocational education at the macro level. From Figure 2.7, it can be seen that vocational education and economic development are interrelated.

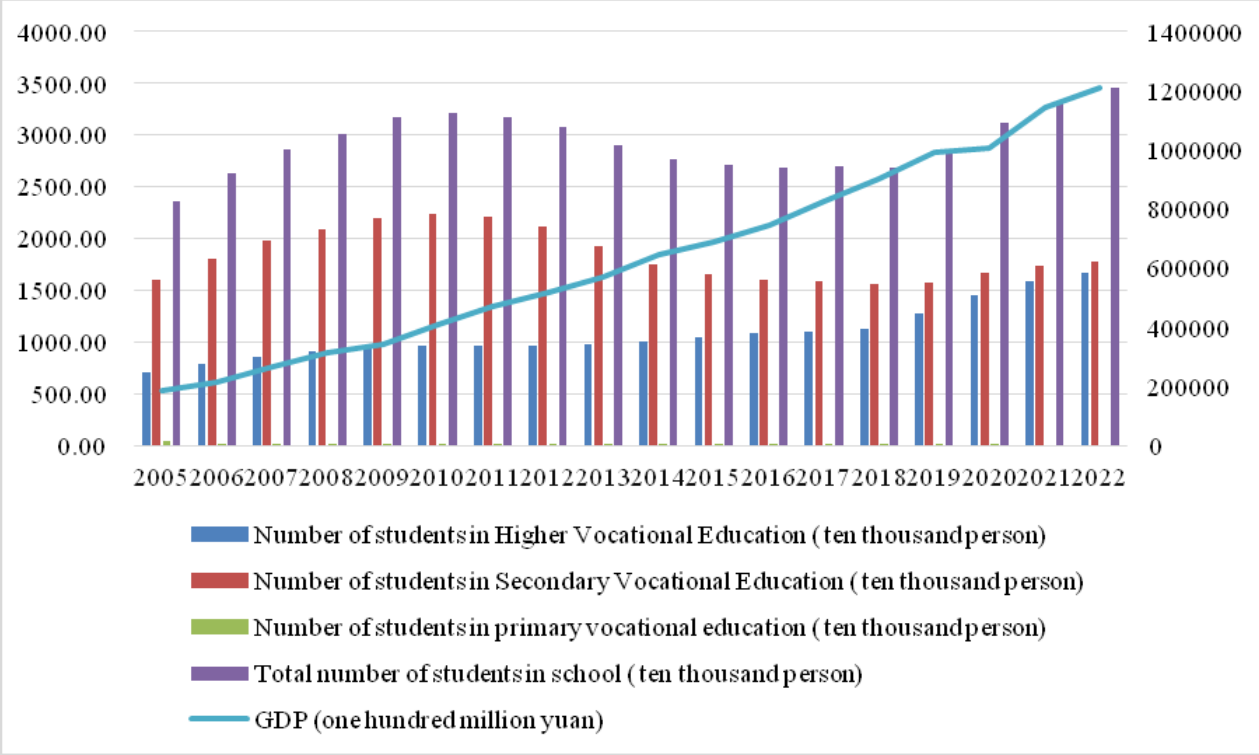

Figure 2.7 - Number of students in various vocational schools and GDP in China from 2005 to 2022.

Source: Data sourced from the National Bureau of Statistics and the Ministry of Education

The development of China's economy has always been supported by large-scale vocational education, which needs to cultivate skilled talents in line with social and economic development. The average annual enrollment of 28 million students in China has injected strong impetus into the country's economic development. Especially with the steady growth of the scale of higher vocational education, China's high-end

technical and skilled talents have been well supplied, providing strong human resource support for achieving the transformation of the national economic structure and entering the high-end manufacturing industry. On the contrary, the economic scale of up to 18 trillion US dollars also greatly supports the development of vocational education, which is a strong economic foundation and important support for the high-quality development of vocational education. This forms a virtuous cycle between the two and promotes the development of vocational education to a higher level.(Liu et al., 2021)

The above reflects the synergistic development relationship between socio-economic development and vocational education, which promotes and improves each other, providing sufficient impetus for the improvement of economic level.

The strategic adjustment of economic structure has become an important part of the transformation of China's current economic development mode, and various regions in China are accelerating the transformation of economic development mode, making scientific and technological development an important direction for economic development in the future period. The development of vocational education, which combines the dual attributes of education and economy, can effectively achieve a high coupling between education and human capital investment. The inherent nature of vocational education determines its position in economic development. Vocational education can continuously transport technical and skilled talents with high quality to corresponding regions, gradually becoming an important factor in explaining economic development (Gao., 2015). Therefore, as a vocational education that serves the development of the economy and society, its development can greatly affect or even determine the quality and efficiency of the transformation of the economic growth mode.

Firstly, vocational education ensures the effective implementation of economic development strategies. Due to significant differences in economic, political, cultural, and social realities in different regions, there are also significant differences in the development of vocational education. The accumulation of human capital presents significant differences, resulting in inconsistent economic development strategy

choices. For regions with low levels of education development and low labor quality for a long time, labor-intensive industries can be prioritized as the leading industry to promote economic development. For regions with good education foundation and high labor quality for a long time, in order to promote economic development, complete systems can be established and good financial support can be implemented, High tech industries can be chosen as the leading industry in the region. Therefore, a region should choose corresponding development strategies based on its actual situation, and choose multi-level strategies that are in line with the regional economic development based on the local level of vocational education development and human resource distribution. According to the regional economic development status, the development of vocational education plays an important role in improving employment levels, increasing the stock of human capital, and promoting economic development. Various regions can attract a large number of young students of appropriate age into vocational education. During the training and education process, these young students' theoretical knowledge is constantly enriched, and their skills and abilities are also continuously improved. While achieving educational effects, they can also achieve investment in human capital and ultimately cultivate skilled talents suitable for economic development. Therefore, the scale, quality, and characteristics of the development of vocational education have an important impact on the implementation of economic development strategies.

Secondly, vocational education promotes the continuous improvement of the soft environment for economic development. The speed and quality of economic development are largely constrained by the soft environment of economic development. Relevant studies have shown that the speed and level of economic development can positively affect the dependence on the soft environment, that is, the faster and higher the economic development speed and level, the stronger the dependence on the soft environment (Yang., 2010). The soft environment of economic development mainly refers to the necessary humanistic and moral environment in the process of economic development, including folk customs, honesty and trustworthiness, love and dedication, and civilized and polite manners. Under the

conditions of a market economy, regions with better investment environments are more favored by investors. In the current situation where the hardware environment in various regions has been generally improved and competition is becoming increasingly fierce, it is necessary to continuously improve the software environment for economic development in order to form a comparative advantage. In the process of constructing a soft environment, people play a central role, and the improvement of the soft environment is largely influenced by people's ideological concepts. Education plays a crucial role in the change of people's ideological concepts. The development of vocational education plays an important role in creating a good soft environment. It can shape people's outlook on life, worldview, and values to meet the needs of economic development, constantly transform outdated ideas, customs, and production and lifestyle, form a thinking mode and modern civilization that adapts to the times and economic development, continuously promote institutional innovation, and form a good social atmosphere, To achieve economic development. The "Modern Vocational Education System Construction Plan (2014-2020)" jointly issued by six departments including the Ministry of Education, the Ministry of Human Resources and Social Security, and the Ministry of Agriculture clearly states that the students trained in vocational education are inheritors of Chinese ethnic crafts and culture. Vocational education should fully include products, crafts and culture with national characteristics. The whole process of vocational education should fully reflect national culture, cultivate folk artists, skilled masters and inheritors of Intangible cultural heritage, constantly promote the construction of soft environment and promote economic development.

Thirdly, vocational education has accelerated the optimization and upgrading of China's industrial structure. The upgrading of industrial structure is a process of gradual transformation from low-level to high-level. It is an important part of the transformation of economic growth mode, including the transfer and upgrading of the Primary sector of the economy to the Secondary sector of the economy, and then to the Tertiary sector of the economy, as well as the transfer and upgrading of labor-intensive industries to technology intensive industries. On the premise of ensuring agricultural

production, through the transformation function of vocational education, the proportion of China's agricultural population has decreased from 89% in 1950 to 36% in 2020. More human resources have been invested in the Secondary sector of the economy and Tertiary sector of the economy with higher production efficiency, directly promoting the rapid growth of China's GDP. (See Figure 2.8) The adjustment of economic structure is an important internal driving force for economic development, including gradually promoting the transformation and upgrading of traditional industries, and achieving the development of characteristic industrial economies. With the gradual transformation of the Chinese economy towards high-quality development, the important factor that restricts the high-quality development of the Chinese economy has been reflected in the shortage of innovative and applied talents. The practical and technical talents trained in vocational education can effectively promote rapid economic development. Vocational education can be seen to some extent as an important form of human investment. The high-quality applied technical talents cultivated by vocational education ensure a continuous increase in the supply of composite, skilled, and innovative talents, which directly affects the upgrading of industrial structure. With the gradual deepening of the reform of vocational education mechanism and system, Chinese vocational education has closely integrated talent cultivation with industry demand and economic development. The direction and structure of education are constantly being adjusted, and the curriculum system, teaching content, and talent cultivation mode of vocational education are also constantly being reformed. Students' professional quality and practical ability are constantly improving, and their service ability for economic construction is continuously enhanced. The talents cultivated by vocational education are local talents who play a crucial role in the production process. Therefore, the development of vocational education can provide sufficient human resources for economic development, continuously promote the transformation and upgrading of industrial structure, and achieve the transformation of economic growth mode (He et al., 2016).

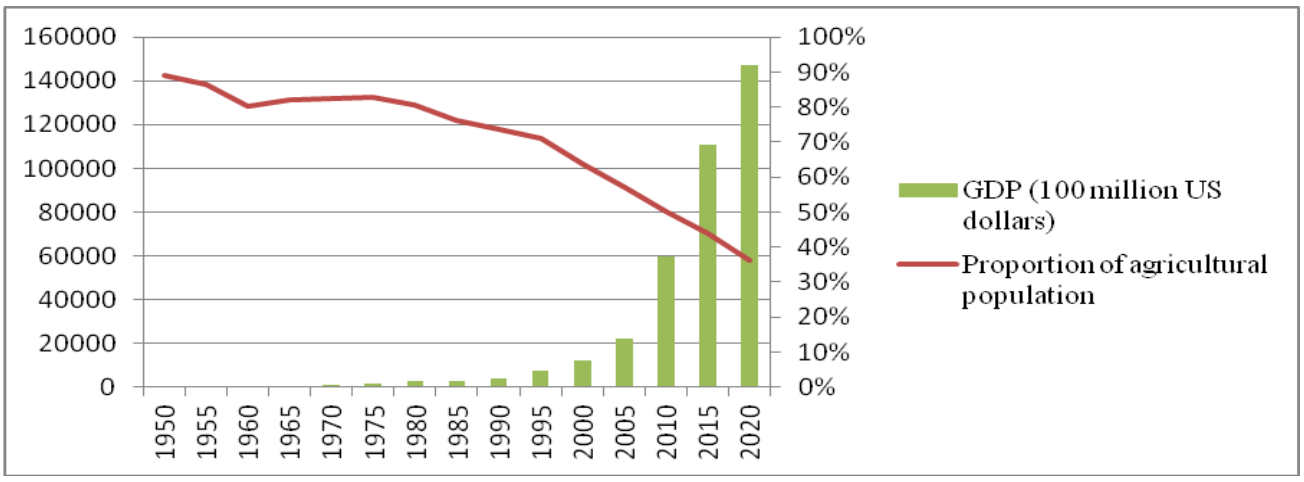

Figure 2.8- The proportion of agricultural population and GDP in China from 1950 to 2020

Source: Data sourced from the National Bureau of Statistics.

Fourthly, vocational education can achieve rapid transformation driven by innovation. The stage of China's economy driven by factors has come to an end and is undergoing a new stage of development from efficiency driven to innovation driven. "Insisting on innovative development" (People's Daily., 2015) was clearly proposed at the Fifth Plenary Session of the 18th CPC Central Committee, and innovative development has entered the strategic level. The primary driving force for sustainable economic development lies in innovation, which is the key to economic development, and the various talents provided by vocational education are the top priority for improving innovation capabilities. From Schumpeter's innovation theory to Schultz's (1961) theory of human capital, (Schultz., 1961) the ultimate foothold lies in education. The implementation of the innovation driven development strategy requires not only a large number of talents such as engineers, scientists, and entrepreneurs, but also a large number of highly skilled talents and high-quality workers. The high-end and top-notch talents needed to meet innovation can be achieved through training and introduction, but thousands of technical and skilled talents and high-quality workers cannot be satisfied through introduction. Only through vocational education can they be continuously satisfied. The role of vocational education in innovation is not only reflected in the accumulation of human capital and direct participation in research and

development, but also in the differentiated talents cultivated by vocational education, as well as the promotion of innovation and the manufacturing of innovative achievements by these talents. At present, there is a shortage of skilled talents suitable for economic development in China, and the low quality of workers is also an important factor restricting innovation. This makes it difficult for a large number of innovative achievements to be converted into productivity in a timely manner, preventing the transformation and diffusion of advanced technology. Therefore, vocational education needs to accelerate its development in order to effectively achieve innovation driven, comprehensively improve the quality of a wide range of workers, and promote coordinated economic development.

Fifth, vocational education can effectively enhance the effectiveness of poverty alleviation and assistance. The 19th Congress of the CPC clearly stated: "We should not only improve the vocational education and training system, continue to deepen the integration of industry and education and school enterprise cooperation, but also do a good job in continuing education, improve the speed of building a learning society, and vigorously improve the national quality"(Shi et al., 2019). These formulations are completely consistent with the contradiction between the growing needs of the people for a better life and the imbalanced and insufficient development, indicating the direction of vocational education development. In accordance with the basic requirements for building a moderately prosperous society in an all-round way put forward at the Fifth Plenary Session of the 18th Central Committee of the CPC, by 2020, under the current standards, China's rural poor population has truly lifted their hats, all poor counties have been removed, and the overall regional poverty problem has been solved. The fundamental reason for the complete victory in the poverty alleviation campaign is that the Chinese government fully values the role of vocational education, and under the guidance of the poverty alleviation development concept of "supporting intelligence first and strengthening education first", combines the support of intelligence and spirit. While blood transfusion is used, more attention is paid to hematopoietic function, ensuring that the hematopoietic capacity of the impoverished population in poverty-stricken areas continues to improve, and ensuring that the people

of the whole country can smoothly enter a moderately prosperous society. A key focus of poverty alleviation and development work is to implement education poverty alleviation, and practice has proven that vocational education plays an important role in poverty alleviation. Vocational education can effectively solve the biggest livelihood problem of employment, continuously improve the ability of workers to lift themselves out of poverty and become rich. At the same time, high-quality frontline technical and skilled talents in production and management are provided to poverty-stricken areas, promoting economic development in these areas, To achieve cultural prosperity and prosperity. Vocational education can also ensure that students from impoverished families in poverty-stricken areas can enjoy the right to education, reduce dropouts and dropouts due to poverty, acquire cultural knowledge and skills through education, drive impoverished families out of poverty, block intergenerational transmission of poverty, and enable impoverished areas and families to fundamentally overcome poverty and truly achieve a moderately prosperous society.

Strategies for China's vocational education to adapt to economic interactive development, there are several points. Improve the level of collaborative governance among multiple entities. The development of vocational education involves multiple subjects, and there are certain differences in the interests and demands of each subject. An effective co governance mechanism should be established to continuously improve the level of collaborative co governance among multiple entities. The collaborative governance of multiple subjects should comprehensively consider the interests of multiple subjects and effectively gather them together to construct a multi-dimensional framework for the development of vocational education, including government, industry organizations, enterprises, and schools(Zhang., 2015). Gradually forming a vocational education development model guided by the government, guided by the industry, with the participation of enterprise entities, and implemented independently by institutions.

Form a consensus on the values of diverse subjects. The identification and consensus of multiple subjects are the source of governance authority in the development of vocational education, and the main characteristic of governance

authority is resource oriented. The governance level of vocational education has a significant impact on the level of vocational education. The governance of vocational education should be based on the consensus and recognition of the majority of organizational members. To truly obtain the conscious recognition and obedience of multiple participating entities in vocational education governance activities, it is necessary to coordinate the rights and contradictions of all participating entities and ensure that the rights and interests of all participating entities can be met. The diverse subjects involved in the development of vocational education have different interests and demands, and the distribution of power is inconsistent. The conflicts between interests and power among different subjects are inevitable, which leads to differences in opinions among various subjects in the governance of vocational education in the development of vocational education. This objectively requires that diverse subjects should be based on voluntariness, equality, and democracy, engage in effective communication and repeated negotiations, establish a scientific coordination mechanism, and resolve the contradictions and conflicts among the participating subjects in the development of vocational education. In addition, the goal should be "publicity" and a consensus of values should be formed among multiple subjects. Vocational education should aim to maximize public interests, and at the same time, diverse entities should also pursue the common value of "good governance" in the development of vocational education, ultimately achieving the ultimate goal of "good education". Of course, while emphasizing public nature, private interests cannot be ignored. Public interest should be based on private interest, and without it, public interest will no longer exist (Xu., 2008). Therefore, while valuing the public nature of vocational education governance, it is also necessary to consider the respective interests of multiple stakeholders and strive to achieve a balance between public and individual interests. Only by reaching a consensus on the above issues can the development of vocational education receive support from multiple stakeholders, improve governance levels, and promote the development of vocational education.

Enhance collaborative innovation among multiple entities. In the development of vocational education, the collaborative governance of multiple entities, including the

government, industry organizations, enterprises, and schools, is essentially an innovation in institutional mechanisms. This innovation is the collaborative governance of multiple entities, a process of coordination and cooperation among multiple entities participating in the development of vocational education in order to achieve established goals. The smooth implementation of this process cannot be separated from collaborative innovation. The collaborative innovation of diversified governance in the development of vocational education refers to the organic aggregation of innovation resources and elements, breaking down the barriers between innovation entities, fully releasing the vitality of innovative elements such as talent, technology, information, and capital among each entity, and ultimately achieving deep cooperation among all entities. To fully showcase the collaborative innovation of multiple entities, one is to have a good top-level design, which is mainly formulated by the government. The policies and regulations formulated by the top-level design should clarify the rights, responsibilities, and obligations of multiple entities, ensuring that the guiding function of the top-level design is fully utilized. The government should also provide a good external environment through institutional design to promote the diversified co governance effect of vocational education development (Nan., 2016). Secondly, the functions of industry organizations should be fully valued. "De-industrialization" is not the proper intention of collaborative innovation among multiple entities in the development of vocational education. Industry organizations should attach importance to the development of vocational education as much as they care about enterprises, and strive to fulfill their obligations to serve the development of vocational education. Industry organizations should actively lead and serve enterprises, and contribute their own strength in collaborative innovation. The third is to continuously promote innovation in the process of problem-solving. Collaborative innovation through collaborative governance by multiple entities is a challenging task that cannot be achieved overnight. Only by continuously summarizing the problems that arise in collaboration can innovation be effectively achieved, and the collaborative governance mechanism be continuously improved to provide new paths for collaborative innovation in the development of vocational education. Fourthly,

institutions should fully play their role in collaborative innovation, firmly adhere to the concept of quality first, rely on innovative development, effectively gather resources and forces from diverse governance, and improve the quality of cultivating technical and skilled talents.

Improve the evaluation mechanism for diverse subjects. Vocational education can provide learners with various experiences to adapt to environmental changes, as well as continuously improve their ability to transform the environment, create wealth, participate in social life, promote social development, and create new experiences. This can also provide sufficient human resources for enterprises and satisfy their interests. The driving force behind the development of vocational education is the sustained demand for human resources in economic development, and vocational education can meet the demand for human resources in the economy and society.(He., 2018) In order to ensure that this demand is met and to safeguard the interests of all participants, it is necessary to establish a scientific multi-subject co-governance evaluation mechanism. The rational allocation of vocational education resources should meet the needs of the labor market and the student market. The development of vocational education is in direct proportion to the needs of the labor market and the student market. In recent years, in order to promote the development of vocational education, governments at all levels have increased their policy preference and investment in vocational education, but the efficiency of multi-subject co-governance including the government, industry organizations, enterprises and institutions has not been significantly improved , the most important reason is the lack of scientific multi-subject evaluation mechanism. In the process of pluralistic co-governance, the concept of performance evaluation should be introduced to evaluate the effectiveness of multi-subject co-governance, pay attention to the synergy efficiency and quality of multi-subjects, and at the same time change the traditional top-down evaluation method and adopt the first The method of tripartite evaluation enhances the objectivity and fairness of evaluation, continuously improves the quality of evaluation, and then enhances the effect of multiple governance and promotes the development of vocational education.

Establish a multi subject accountability mechanism. The common participation of multiple subjects in the development of vocational education is a typical feature of collaborative governance. Therefore, the development of vocational education must clarify the governance responsibilities of each subject, ensuring that each participating subject can clarify their own responsibilities, powers, and obligations. This can make the governance boundary clear, determine the direction of governance, facilitate industrial coupling effect, and avoid unclear power and responsibility The phenomenon of "kicking the ball" has caused obstacles to the development of vocational education. How can we ensure that diverse subjects truly take on corresponding responsibilities in the development of vocational education, better participate in the diversified governance of vocational education, and promote the development of vocational education. The most effective method is to establish a multi subject accountability mechanism. Effective measures should be taken to continuously improve the sense of responsibility and ability of organizational members, so that they can avoid problems and bravely assume their due responsibilities. At the same time, they should also have the corresponding ability to fulfill their obligations. On the basis of clarifying the responsibilities, powers, and obligations of each participant, a strict accountability mechanism should be established. For those who can consciously fulfill their responsibilities and obligations and efficiently complete the tasks they undertake in the development of vocational education, appropriate rewards should be given, which can be material rewards or spiritual praise, continuously motivating their enthusiasm for participation. At the same time, for those who neglect their duties in the development of vocational education, corresponding punishments should be given and negative incentives should be adopted to urge them to strive forward. Accountability is not just a system for punishing the subject, prevention and correction are its main functions, and prevention is its focus. Punishment is not the ultimate goal of accountability, but the ultimate goal should be to prevent and stop the improper behavior of the participating parties, enhance the collaborative consciousness of the participating parties, improve the level of vocational education governance, and promote the development of vocational education. Therefore, the multi subject

accountability mechanism for the development of vocational education should shift from post accountability to preventive accountability.

Adhere to government guidance on vocational education governance. Vocational education can be said to be a "public good" or "public service" to some extent. In the process of its development, the government's guiding role is becoming increasingly apparent. The government is the macro regulator of the development of vocational education, and its governance system for vocational education lays the foundation for its development. Moreover, the government's governance ability and methods for vocational education determine the direction of its development, The government should fully assume its responsibilities in the process of functional transformation, reasonably streamline administration and delegate power, manage in service, serve in management, adhere to the guidance of the government, fully coordinate the relationship between the government, industry organizations, enterprises, and institutions, ensure that the governance capacity of vocational education can be continuously improved, and promote the sustainable development of vocational education in China.

Strengthen the legal governance of vocational education. At present, the rule of law in education and school management implemented by the Chinese government has not been widely recognized by the public. The majority of the public believe that the legal concept of vocational education in China has been preliminarily established, but more emphasis is placed on the rule of man. The transformation from policy regulation to legal governance is the only way to solve the problem of rule of law. The smooth development of vocational education is inseparable from the legal governance of vocational education. The management mode of "policy first" should be changed. The government should take various effective measures to continuously improve the enthusiasm of vocational education legislation. Relevant management departments should be brave to assume responsibility and formulate laws and regulations related to the adjustment of vocational education interest relationship as soon as possible. The government can fully draw on the experience of the West and formulate a vocational college law that covers both secondary and higher vocational education, providing

legal protection for vocational education. In addition, the most important thing for the government to promote the development of vocational education is to establish a modern governance system, which includes various laws and regulations, systems, and related institutional mechanisms involved in the development of vocational education. Through continuous adjustment and optimization of these contents, the level of legalization of the vocational education governance system should be strengthened, and the people-oriented concept should be reflected in various fields of vocational education.

Improve the level of government services. The development of vocational education should be included in the overall planning of economic and social development, and public resources for vocational education should be reasonably allocated to ensure that the scale and structure of vocational education can adapt to socio-economic development. When allocating vocational education resources, the government should consider both efficiency and fairness. Different development goals and requirements for vocational education should be proposed for regions with different development situations, and timely adjustments should be made based on local economic, social, cultural and other actual development situations. The government should increase efforts to cultivate and develop social organizations, including intermediary service institutions and industry associations. While ensuring an increase in the number of intermediary service organizations, it should also ensure the improvement of their quality. It should encourage and guide intermediary service organizations to adopt cooperative and individual proprietorship forms, while integrating and restructuring intermediary service organizations, expanding service functions, and improving service levels. The government encourages intermediary service organizations to participate in vocational education, provide corresponding convenience for them, and also increase their business supervision and guidance, and strictly punish illegal service behaviors. The government should also establish various public information service platforms, including employment information systems, vocational education institutions information exchange systems, information monitoring systems, etc., to continuously improve its public service supply capacity.

Increase government financial support. The government should constantly adjust the distribution structure of general higher education and vocational education public education funds, strive to increase financial support for vocational education, and ensure that the proportion of vocational education budgetary funds in the national budgetary education funds can match the proportion of vocational education scale . Governments at all levels should increase funding for vocational education so that the development of vocational education can have sufficient financial support. The central government should adjust the layout and structure of vocational schools, integrate vocational education resources, and increase investment in vocational education. Properly increase special subsidy funds for vocational education, including scholarships, grants, etc., to increase the channels for students with financial difficulties to obtain financial subsidies. Special funds can also be used to strengthen vocational education teacher training, strengthen the construction of multimedia educational resources, and strengthen the development of vocational education courses, etc. , and make full use of taxation and financial means to enhance the enthusiasm of enterprises to participate in vocational education, and contribute to the development of vocational education.

Enhance the effectiveness of industry organization guidance. An important weakness in the development of vocational education in China is that the function of industry organizations in guiding vocational education is difficult to effectively play. In the process of guiding vocational education, industry organizations not only have deficiencies in guidance capabilities, platforms and mechanisms, but also outdated guidance methods, which will affect the effectiveness of industry organization guidance. Even under the mobilization of a high degree of consensus and broad policies, in order to enhance the effectiveness of industry organization guidance in the development of vocational education, it is necessary to strengthen administrative coordination, improve institutional mechanisms, enhance the professional level of industry organization guidance, evaluation, and services, and support them with systematic policies.

Clarify the specific responsibilities of industry organizations. At present, industry organizations have been positioned by the country as an indispensable and important force that can effectively promote the development of vocational education. All sectors of society have begun to pay attention to their role in the development of vocational education, and this positive impact has already is widely recognized. However, industry organizations also have certain problems in the process of promoting the development of vocational education. The specific performance is that the responsibilities of industry organizations in the development of vocational education are not very clear and specific. How and which roles and functions of industry organizations can be fully brought into play are all based on the wishes of industry organizations, which in turn leads to varying results in the participation of industry organizations in vocational education. Therefore, the responsibilities and scope of work of industry organizations in the development of vocational education should be clearly defined. For example, based on the characteristics of industry organizations, the industry organizations involved in the development of vocational education can specifically carry out talent demand forecasting and participate in the formulation of industry organizations involved in the development of vocational education. The qualification standards of practitioners, participation in the formulation of vocational skills appraisal, participation in the formulation of education and training plans, etc. shall be specified in detail, and their work content and responsibilities shall be clarified.

Establish a scientific industry organization leadership mechanism. Enhance the enthusiasm of industry organizations to participate in the development of vocational education. The government and all sectors of society have reached a consensus on establishing and improving institutions-running mechanisms such as government guidance, industry organization guidance, enterprise participation, and school implementation. Judging from the current situation, the strengthening of the guiding role of industry organizations is entering a period of "institutionalization" development. A good top-level design can provide a standardized system for institutional development and ensure its effective operation.(Zhao et al., 2015) By fully utilizing

the board of directors, industry organization guidance committees, and cooperation offices of vocational education institutions, we continuously expand communication and cooperation channels between institutions and governments, industry organizations, and enterprises, and gradually establish a connection mechanism between organizational structures and decision-making systems of different stakeholders. Emphasize the establishment of cooperation platforms, continuously improve the level of cooperation and expand cooperation space, and use the participation mechanism of industry organizations as a starting point to continuously enhance their guiding role in the development of vocational education. At the same time, under the effective leadership mechanism, efforts should be made to form effective communication and coordination mechanisms and interest expression mechanisms to promote the effective connection between the vocational education system and the external society, and to enhance the guiding role of industry organizations. In addition, the guidance of industry organizations and the importance of participating in vocational education must reach a consensus among various participating entities, which requires mutual cooperation and understanding to ensure the utilization of collective wisdom and maximize the role of industry organization leadership mechanisms in promoting the development of vocational education.

Pay attention to the improvement of the "smart service" capabilities of industry organizations. From the current situation, the function of industry organizations in participating in vocational education is weak, and the service concept has not yet formed. So industry organizations should attach great importance to the absorption and cultivation of talents, including those who are willing to engage in industry organization services, and continuously improve their service awareness, so as to break away from the "small workshop" and improve their coordination, communication, innovation, and activity abilities. We also need to attach importance to the cultivation of industry expert teams, establish an industry expert database, and provide think tank services for industry development. After the development and growth of industry think tanks, the abilities of industry organizations such as "discourse power, funding independence, and standard power" have been continuously improved. Industry

organizations also need to vigorously develop member units, expand service content, undertake government functions and fulfill them well, truly highlight smart services, continuously improve the service awareness of industry organizations, and actively carry out proactive services. In addition, it is necessary to strengthen the data information services of industry organizations. Industry organizations must ensure the authenticity, reliability, effectiveness, and scientificity of the data they provide. The most important thing is to ensure the authenticity of the source during the data collection process, ensure its scientificity in operation, and have suitability in the information sharing process. Industry organizations should make full use of their data information resources to grasp the key to smart services and continuously improve their capabilities in smart services.

Promote the full play of the role of enterprise entities. An important subject in the development of vocational education is enterprises, which is not only a need for their own development, but also an inevitable choice to build a modern vocational education system and promote the development of vocational education. Vocational education has made significant progress in recent years, and the multi subject co governance system that has been formed, including government guidance, industry guidance, enterprise participation, and institution implementation, has been widely recognized by society. Enterprise participation can effectively promote the development of vocational education. With the development of the economy and the widespread attention of various sectors of society, the system and mechanism of enterprise participation in the development of vocational education are constantly improving. At the same time, the educational and talent training models of enterprise participation are also constantly innovating and improving. Although enterprise participation in the development of vocational education has an important positive role, it cannot be denied that there are problems in enterprise participation in the development of vocational education, The issues related to institutional mechanisms, educational channels, and determination of rights and responsibilities have not yet been fully resolved.

Clarify the rights and responsibilities of enterprises and society. The development of vocational education needs to truly play its role in delivering high-quality and

highly skilled talents to society and enterprises. This requires the government, industry organizations, enterprises, and vocational education institutions to collaborate and fulfill their respective responsibilities. Enterprises have become an important educational entity and a significant change in the development of vocational education in China. They share the cost of vocational education through mandatory taxation and voluntary investment. They can also provide feedback on talent needs to institutions and cooperate with their relevant work in the process of deep participation in vocational education teaching, At the same time, it can also lead institutions to cultivate high-quality skilled talents and provide high-quality skill services according to the requirements of industry enterprises. All of the above require enterprises to take on social responsibility, not only economic responsibility, but also political, legal, environmental, and charitable responsibilities, in order to fully promote the role of enterprises in the development of vocational education. However, the current regulations on the social rights and responsibilities of enterprises in the development of vocational education in China are not very comprehensive. Therefore, relevant laws and regulations should be established and improved. Based on the current situation of government guidance, industry guidance, enterprise participation, and institution implementation of vocational education governance, strengthening the dominant position of enterprises in vocational education should take the opportunity of revising Chinese vocational education Law, In the development of vocational education, the main position and functional positioning of enterprises should be more clearly defined, and the responsibilities, rights, and corresponding obligations that enterprises should bear should also be clarified; Further clarify the legal attributes of vocational colleges established by enterprises to ensure their legal identity and status; Further clarification is needed on the specific punishment measures to be given to enterprises that have not undertaken corresponding obligations; Strive to establish and gradually improve the social responsibility system for enterprises to participate in vocational education (Yu., 2015).

Encourage enterprises to carry out diversified education. In order to improve the efficiency of enterprises' participation in vocational education, with the gradual

transformation of government functions and the reduction of intervention in specific educational behaviors, based on the existing educational system, moderately increase the content of enterprises' participation in diversified education. At the same time, it is necessary to create a good educational environment and conditions to promote the effective improvement of diversified education effectiveness. When fulfilling the main responsibility in the development of vocational education, enterprises need to choose an appropriate participation mode based on their own situation and the current situation of vocational education development. One is to encourage qualified enterprises, especially large enterprises, to establish high-level vocational colleges. Large enterprises can independently build vocational colleges, and these enterprises can independently decide on funding methods, school scale, and types of educational products to be developed. Small and medium-sized enterprises with conditions can participate in the establishment of vocational education institutions through various forms such as equity participation and participation. The second is to encourage enterprises to cooperate with vocational colleges to carry out the construction of mixed ownership Secondary College. Strategic emerging industries and key pillar industries should fully leverage their advantages in the industrial field, collaborate with high-level vocational colleges, and strengthen the physical construction of the college through the form of "industrial colleges" to improve the quality of training technical and skilled talents. Thirdly, encourage enterprises to actively participate in the collectivization of vocational education. The establishment of an education group in which enterprises participate is conducive to fully utilizing the advantages of the enterprise's technical standards, talent supply and demand information, and talent training specifications, meeting the demand for high-quality skilled talents in economic development. At the same time, enterprises can hold shares in the vocational education group and obtain corresponding investment returns. Fourthly, encourage enterprises to build high-level productive training bases and technological skill innovation platforms. Enterprises should actively accept students with corresponding skills in relevant majors trained by vocational education institutions for on-the-job internships and provide certain internship subsidies. At the same time, enterprises

should collaborate with vocational education institutions to strengthen the construction of industry education integration platforms that reflect industrial characteristics, in order to serve economic development and industrial transformation and upgrading.

Establish a long-term mechanism for enterprises to participate in vocational education. Enterprises are an important force in China's vocational development, and their participation in vocational education can effectively promote the development of vocational education. In the process of vocational education development, a sustainable long-term mechanism should be established to maximize the driving role of enterprises. Firstly, improve the legal mechanism for enterprises to participate in talent cultivation. A labor protection system for interns can be established to dispel the concerns of enterprises. Before internships, enterprises should sign internship contracts with vocational colleges that comply with legal regulations. The rights, responsibilities, and obligations of enterprises and vocational education institutions should be clearly defined in legal form. Vocational colleges should provide corresponding labor insurance for interns, and both schools and enterprises should strengthen safety education for students before internships to enhance their self-protection awareness and ability. Secondly, improve the motivation mechanism for enterprises to participate in talent cultivation. Enterprises are paying more attention to the human resource needs of their own enterprises. Due to the fact that the cultivation process of non human resources cannot bring direct economic benefits to the enterprise, the enterprise does not attach enough importance to it. This requires the government to establish effective incentive and constraint mechanisms through legislation, such as issuing policies that require enterprises to pay corresponding vocational education and training funds under appropriate conditions. The government is the ultimate distributor of training funds, and enterprises only provide training funds without distribution rights. The government can also provide appropriate tax reduction policies for enterprises that actively participate in vocational education, At the same time, enterprises that fail to fulfill or cannot fulfill their vocational education obligations well should be punished appropriately according to the actual situation to enhance their enthusiasm for participating in vocational education. Finally, improve the mechanism for ensuring and

compensating human capital investment returns. In the process of talent cultivation through school enterprise cooperation, enterprises will pay corresponding costs. The government can provide certain financial support to enterprises actively participating in vocational education through special subsidies and long-term loans, and can also reduce student mobility risks and compensate for cost losses by stipulating compensation agreements between enterprises and training students.

Clarifying the property rights boundary of vocational education school enterprise cooperation. The full play of the role of enterprise entities in vocational education cannot be separated from the clear property rights boundary in school enterprise cooperation. In a sense, vocational education school enterprise cooperation is a process of rebuilding the property rights order and improving governance efficiency. When the country carries out management system reform due to organizational costs and system costs, the Economic surplus right obtained by vocational education institutions from enterprises will be eliminated because of the existence of this property right system, and the only incentive mechanism for vocational education institutions will become administrative promotion. The development of vocational education will become inefficient, slow, and have poor self-adjustment ability as a result. In vocational education, school enterprise cooperation partially transfers the rights formed by skills, and under the influence of market mechanisms, enterprises can obtain stable and legitimate output. At the same time, relevant vocational education institutions can also receive certain informal institutional incentives, continuously increasing their discourse power in local governments, and then transforming them into specific administrative incentives. In the development of vocational education, the property rights boundary between vocational education institutions and enterprises can be defined through contracts. Institutions and enterprises cooperate and cooperate with each other to ensure the maximization of national interests and protect the innovation of school enterprise cooperation organizations, promoting the effective development of vocational education (Zhu., 2016).

Strengthen the independent execution ability of vocational education institutions. Only by taking vocational education institutions as the core of action and continuously

improving their autonomous execution ability can we effectively improve the level of educational governance and achieve better governance results, ultimately benefiting the development of vocational education.(Li et al., 2014) At the same time, it is pointed out that vocational education institutions must be taken as the basic foothold in order to establish a sound education governance system and enhance the modernization level of education governance capabilities.(Yuan., 2014) Therefore, the dominant position of vocational education institutions in the modern vocational education governance system should be valued and continuously strengthened, enhancing the initiative of vocational education institutions, strengthening their execution power, and effectively promoting the development of vocational education.

Expand the autonomy of vocational education institutions in running schools. At the institutional level, through reasonable institutional design, vocational education institutions can gain autonomy in professional settings, personnel selection, and encourage them to build characteristic majors. At the same time, they can continuously expand their power in selecting textbooks, recruiting students, and developing courses, actively promote the establishment of diversified educational models such as enterprise participation and government guidance, and encourage vocational education institutions to raise funds through multiple channels, On the basis of public education, support private education and increase efforts to support private education, promote the status of private vocational education, and ensure that its unique educational function can be fully utilized. Firstly, more attention should be paid to institutional arrangements in governance, and the construction of a system that separates "management, operation, and evaluation" should be strengthened to ensure balanced development, including the autonomy of institutions in running schools, the organizational evaluation power of society, and the educational management power of the government. This will effectively ensure that vocational education institutions operate and manage themselves in accordance with the law. Secondly, vocational education institutions should strengthen the construction of their bylaws, clarify the responsibilities, authorities, and various relationships among various stakeholders, introduce industry enterprises into their internal governance structure, and

continuously improve the internal governance of vocational education institutions. Once again, we need to continuously expand the autonomy of cooperation between vocational education institutions and enterprises, delegate more power to vocational education institutions, increase channels for school enterprise cooperation, and also enhance the integration of industry and education, promote the synchronous development of theory and practice, guided by the concept of equality, sharing, and mutual assistance, further expand the breadth and depth of school enterprise cooperation, and strengthen institutional and organizational construction to ensure sustainable development of school enterprise cooperation. Finally, continuously enhance the decision-making and participation rights of vocational education institutions in vocational education, and effectively enhance their autonomy.

Strengthening the construction of a new type of teacher team. Currently, the overall quality of Chinese vocational education teacher team is relatively good, but the pure attributes of public institutions and the management model of quasi civil servants used are difficult to adapt to the requirements of vocational education development. If no changes are made, vocational education institutions will lose competitiveness, not only affecting the survival of vocational education institutions, but also affecting the development of vocational education, So it is necessary to strengthen the construction of a new type of teacher team to change this passive situation. The new type of teacher team should be able to achieve the following points: firstly, it is necessary to combine theory with practice, based on the construction of a theoretical teacher team, and in accordance with the requirements of economic development, industry development, and enterprise technological innovation, focus on strengthening the construction of a practical teacher team, continuously enhancing the ability of professional teachers to solve practical problems, in order to improve people's ability to pursue and achieve high-quality life and development; Secondly, it is necessary to combine full-time and part-time jobs, and on the premise of ensuring the number of professional teachers, attach importance to the introduction of part-time teachers from industry enterprises and society, and continuously improve the structure of the teaching staff; The third is to strengthen the combination of theoretical learning and practical skills improvement

for teachers, establish a comprehensive system of guidance and training for teachers' further education, continuously update teachers' knowledge, improve teachers' abilities, cultivate students with new knowledge and skills, and enhance their comprehensive quality in order to better adapt to social development and highlight the advantages of vocational education.

Establish and improve a professional structure suitable for economic development. Education management departments should give vocational education institutions flexible autonomy in professional settings. The professional structure of vocational education institutions should adapt to economic development in accordance with market demand. Vocational education institutions serve the development of industrial economy through professional settings. At the same time, professional settings are an important carrier for vocational education to cultivate talents and an important basis for reflecting the level of vocational education institutions. The development of vocational education institutions relies on economic development. If vocational education institutions want to achieve sustainable development, they must not deviate from economic development. The level and quality of vocational education institutions must be continuously improved, and their professional settings must be well aligned with economic development. Guided by changes in industrial structure and development direction, they must constantly adjust their professional structure to make the technical talents they cultivate suitable for economic development. On the one hand, vocational education institutions must pay timely attention to the development direction of the industry during the development process, so that vocational education institutions can more accurately grasp the direction of talent cultivation. On the other hand, various effective measures should be taken to collect and obtain various information on industrial upgrading to the maximum extent, in order to accurately judge the job and career changes brought about by economic development, adjust the direction of talent cultivation in a timely manner, and provide sufficient human resources for economic development. Overall, the professional setting of vocational education institutions is a long-term and dynamic adjustment process. It is necessary to focus on building local characteristic majors according to the characteristics of

economic development. While key majors are valued, general majors should also be taken into account, so that vocational education can better promote economic development. Based on the above theory, we will organize the key points of improving the multi agent collaborative governance strategy into Table 2.2, in order to quickly understand this strategy.

Table 2.2- Key points of enhancing the collaborative governance strategy of multiple entities.

Key point	Content
Improve the level of collaborative governance among multiple entities	Forming a consensus on the values of diverse subjects.
	Enhance collaborative innovation among multiple entities.
	Improve the evaluation mechanism for diverse subjects.
	Building a diversified accountability mechanism for entities.
Adhere to government guidance on vocational education governance	Strengthening the rule of law governance of vocational education.
	Improving the level of government services.
	Increase government financial support.
Enhancing the effectiveness of industry organization guidance	Clarify the specific responsibilities of industry organizations.
	Establish a scientific industry organization leadership mechanism.
	Emphasize the improvement of industry organizations' "smart service" capabilities.
Promoting the full play of the role of enterprise entities	Clarify the rights and responsibilities of enterprises and society.
	Encourage enterprises to carry out diversified education.
	Establishing a long-term mechanism for enterprises to participate in vocational education.
	Clarify the property rights boundary of vocational education school enterprise cooperation.
Strengthening the autonomous execution power of vocational education institutions	Expanding the autonomy of vocational education institutions in running schools.
	Strengthen the construction of a new type of teacher team.
	Establishing and improving professional structures suitable for economic development.
	Constructing a scientific and effective teaching evaluation system.

Source: Prepared by the author

From Table 2.2, we can see that from the perspective of improving the collaborative governance of multiple entities, our proposed strategy for adapting China's vocational education to economic interactive development is clear and feasible, with high reference and practical value.

Establish a scientific and effective teaching evaluation system. Teaching evaluation can effectively improve and ensure the quality of education, guide the

formation of students' abilities, and also reverse promote the improvement of teachers' teaching abilities. A scientific and effective teaching evaluation system should be based on the needs of the development of vocational education. The evaluation subject should gradually shift from a single evaluation subject of vocational education institutions to multiple subjects including vocational education institutions, industry organizations, governments, enterprises, etc. The original single teaching evaluation of talent cultivation should be changed, and the requirements for talent use in industries and enterprises should be introduced into the new teaching evaluation system, Make teaching internships in vocational education institutions truly industry oriented and job specific. In addition, in terms of teaching evaluation content, the rationality of teaching content, the pertinence of teaching methods, and the emphasis on teaching results should all be important contents of the teaching evaluation system. It is necessary to pay attention to the mastery of relevant theoretical knowledge and the cultivation of professional qualities. Finally, the specific form of teaching evaluation should be based on exams, while taking into account various evaluation forms. Using this form to conduct teaching evaluation, exams can evaluate the mastery of professional theoretical knowledge, and the practical abilities cultivated under the guidance of professional theories should be assessed in specific practice.

2.3. Evaluation of the strategy for improving the competence of managers in professional educational institutions in China

The managers of vocational education institutions are professionals responsible for the management responsibilities of the entire institution, and their qualification in fulfilling their duties in their positions directly affects the development and future of vocational education institutions. Therefore, in order to enhance the social benefits generated by vocational education institutions, the first step is to enhance the competence of the managers of vocational education institutions. This is an important

research topic related to economic development today and a core issue for the healthy development of vocational education institutions.

In the 1960s, competence entered people's perspective as a specialized study. At that time, the US government found that many diplomats who were selected solely based on intellectual factors were seemingly excellent talents, but their performance in practical work was very disappointing. The US government hopes to change this situation and invites psychology professor McClelland to study and design a personnel selection method that can effectively predict actual job performance. In 1973, McClelland published an article in the American Psychologist magazine titled "Testing for Competence Rather than Intelligence". In the 176 issues of the Education Management Quarterly published in the United States from January 1965 to August 2009, there were 115 articles containing "instructional leadership". These articles delve into the close internal connection between teaching and competence in vocational education institutions, and fully discuss the connotation definition, functions and tasks, leadership behavior, and other aspects of teaching leadership. Competency research is a product of social development and progress, and an inevitable result of the refinement of labor division. At present, vocational education institutions face serious problems of imbalanced teaching quality and mismatch between teaching objectives and socio-economic development needs. It is necessary to improve the competence of managers to solve the management problems of a vocational education institution, in order to lay a solid foundation for the good development of vocational education institutions.

Due to the differences in teaching objectives, content, and teaching objects, managers of vocational education institutions have significant differences in their work content and methods compared to managers of general education. In the process of managing vocational education institutions, managers must not only focus on daily teaching quality management, but also on professional construction, practical teaching, and other work. In China, due to the fact that students with better grades generally

choose general education, managers of vocational education institutions also have to face students with poorer grades. The healthy growth of these students often requires more energy from principals, which puts higher demands on the competence of managers.

We believe that the competence of vocational education institution managers is a collection of comprehensive abilities. Managers should demonstrate a high level of leadership ability in influencing, motivating, and guiding faculty members to achieve the development goals of the organization and promote its development (Zhang., 2007). Specifically, in the process of institution construction and management, managers of vocational education institutions should have the corresponding capabilities in planning layout, major decisions, risk assessment, interpersonal communication, communication and expression, school enterprise cooperation, time management, education and teaching, professional construction, curriculum reform, Lifelong learning, psychological pressure resistance, self-development, academic image, cultural construction, cultural education, core competitiveness formation (Li., 2015). Based on the above abilities, we have developed a structural model of managers competency (as shown in Figure 2.9).

Figure 2.9-The Structural Model of Managers Competence.

Source: Prepared by the author

From the Figure 2.9, it can be seen that the competence of vocational education institutions managers can be divided into six levels: analytical and inductive ability, decision-making and planning ability, communication and organization ability, leadership and demonstration ability, evaluation and inspiration ability, and core competitive ability. Among them, analytical and inductive ability, decision-making and planning ability, communication and organization ability, and leadership and demonstration ability are referred to as basic leadership abilities, while evaluating and inspiring ability and core competitive ability are referred to as excellent leadership abilities (Chen., 2009) Managers of vocational education institutions with basic leadership skills can ensure the smooth implementation of various tasks in a vocational education institution through the implementation of management work. To achieve high-quality operation and development of a vocational education institution and achieve excellent educational achievements in the field of vocational education, it is necessary for the managers of vocational education institutions to have excellent leadership abilities.

Conducting a current survey on the competence of managers in vocational education institutions is a practical basis for improving their management level and abilities. Objectively analyzing the practical performance of the competence of managers in Chinese vocational education institutions, identifying their strengths and weaknesses, and proposing targeted improvement suggestions, in line with the deepening of vocational education reform and the development needs of the market economy, is an important measure to improve the management level of vocational education institutions.

For this purpose, this study developed the "Competency Survey Questionnaire for Vocational Education Institution Managers" (see Appendix A). The content of the questionnaire is based on the competency structure model of the managers of vocational education institutions. The preparation process mainly draws on the relevant provisions of the Professional Standards for Principals of Secondary Vocational Education Institutions issued by China in 2015 and the Vocational Education Law of the China issued in 2022, and combines China's requirements for

diagnosis and improvement of the internal quality assurance system of vocational education institutions.

It should be noted that the Chinese Ministry of Education established a diagnosis and improvement system for teaching work in vocational education institutions nationwide as early as 2015. The purpose of this system is to clarify the responsibility of vocational education institutions to fulfill the quality assurance body of talent cultivation work, establish a normalized internal quality assurance system and a sustainable diagnosis and improvement mechanism, and continuously improve the quality of talent cultivation. To achieve continuous improvement in teaching management level and talent cultivation quality. According to the requirements of this system, the internal quality assurance system of vocational education institutions can be described in Figure 2.10:

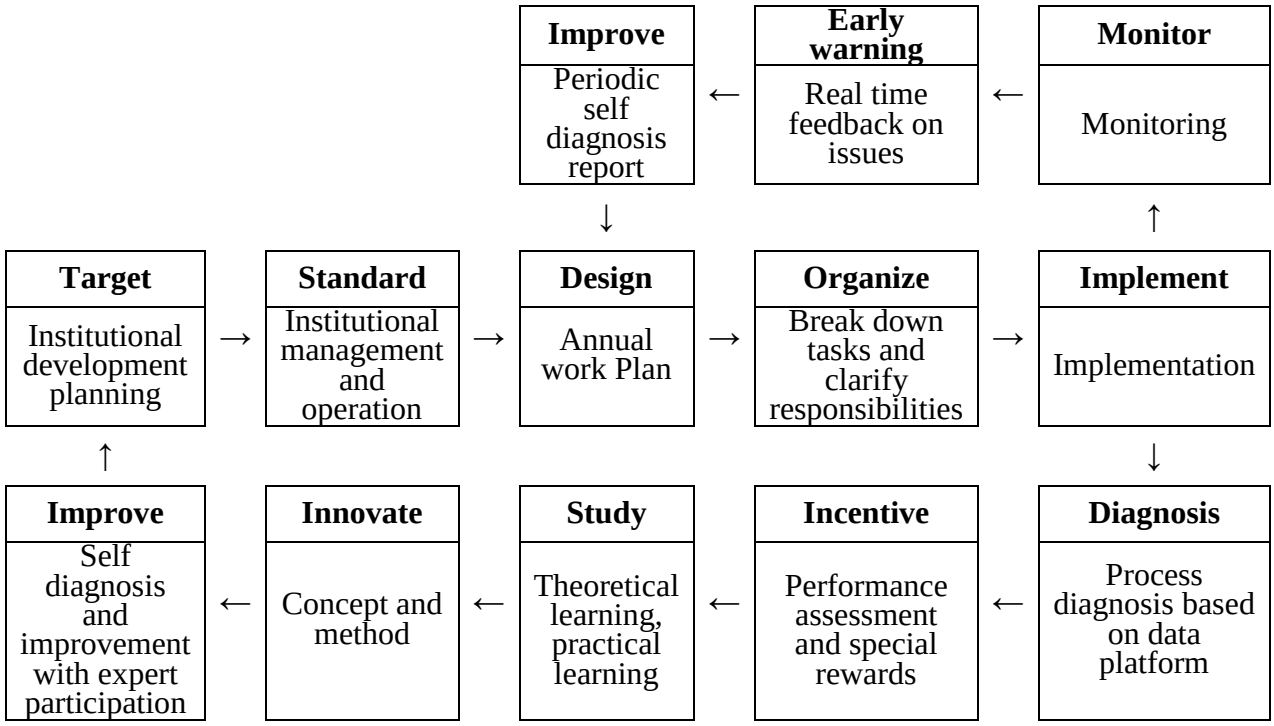

Figure 2.10-Internal quality assurance system of vocational education institutions

Source: Prepared by the author

This system requires vocational education institutions to establish a working mechanism based on talent cultivation work status data, independent diagnosis and

correction of vocational education institutions, and sampling and review by provincial education administrative departments as needed, to promote vocational education institutions to build a networked, fully covered, strong warning and incentive function internal quality assurance system on the basis of establishing a teaching work diagnosis and improvement system.

Through a comprehensive analysis of the above policies, regulations, systems, and socio-economic development needs, we have developed a survey questionnaire. The survey questionnaire is divided into three parts. The first part is a brief description of the survey content, which explains the survey situation. The second part mainly investigates the nature, level, and basic information of vocational education institutions, as well as the research objects; The third part is the survey topic, mainly conducted through single item selection. A total of 60 Multiple choice questions were designed to describe the competency of managers of vocational education institutions from six aspects. The questionnaire used the Likert five point scale scoring method. Use a five point scale to represent the degree of compliance, with 1 indicating complete non-compliance, 2 indicating relatively non-compliance, 3 indicating general compliance, 4 indicating relatively compliance, and 5 indicating complete compliance; All questions are scored positively, and the higher the score of a certain question, the stronger the manager's leadership competence, as shown in Table 2.3:

Table 2.3- Questionnaire scoring rules.

Item	Complete non-compliance	Relatively non-compliance	General compliance	Relatively compliance	Complete compliance
scoring	1	2	3	4	5

Source: Prepared by the Likert 5 point scale scoring method

On the basis of referring to relevant literature and combining actual situations, this study divides the competence of vocational education institution managers into six dimensions: analytical and inductive ability (MC1), decision-making and planning ability (MC2), communication and organization ability (MC3), leadership and demonstration ability (MC4), evaluation and charisma ability (MC5), and core competitive ability (MC6). The research topics under each dimension mainly focus on

professional understanding and identification, professional knowledge and methods Describe it from three aspects: professional ability and behavior.

The survey on the competency status of vocational education institution managers used an intelligent questionnaire system for distribution. The questionnaire was recommended through random intelligence, accurately targeting the target audience, and invalid responses were automatically filtered out by setting various screening rules, screening pages, quota control and other conditions. At the same time, manual screening was used to ensure the effectiveness of the final data. Respondents can answer the questions on their PC or mobile phone, and a total of 631 valid questionnaires can be collected during the validity period. By analyzing the collected questionnaires, the main focus of the research is on teachers, middle-level cadres, and leaders serving in vocational education institutions.

The basic information of the respondents is as follows: among the 631 respondents, 9.52% were aged between 25 and 30, 22.22% were aged between 31 and 40, 49.21% were aged between 41 and 50, and 19.05% were aged between 51 and 60. (See Figure 2.11) From an age perspective, young and middle-aged practitioners in Chinese vocational education institutions are the dominant force, with strong energy, work enthusiasm, and initiative, making them the backbone of vocational education.

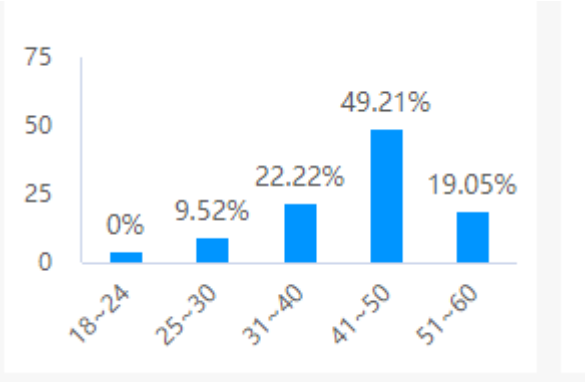

Figure 2.11- Age structure of respondents

Source: Prepared by the author

All surveyed individuals have a college degree or above. Among them, 6.35% are college, 55.56% are bachelor degree, 36.51% are master's degree, and 1.59% are

doctoral degree. Due to the random selection of data, it also proves that the main teaching staff in Chinese vocational education is mainly composed of undergraduate and master's degrees. (See Figure 2.12)

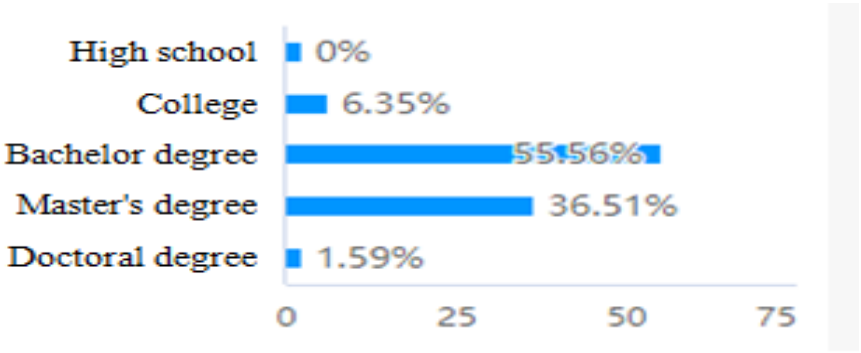

Figure 2.12- Educational composition of the respondents

Source: Prepared by the author

96.83% of the surveyed individuals hold professional titles at all levels. Among them, 6.35% hold senior professional titles, 33.33% hold deputy senior professional titles, 39.68% hold intermediate professional titles, and 17.46% hold junior professional titles. The data is normally distributed as a whole. (See Figure 2.13)

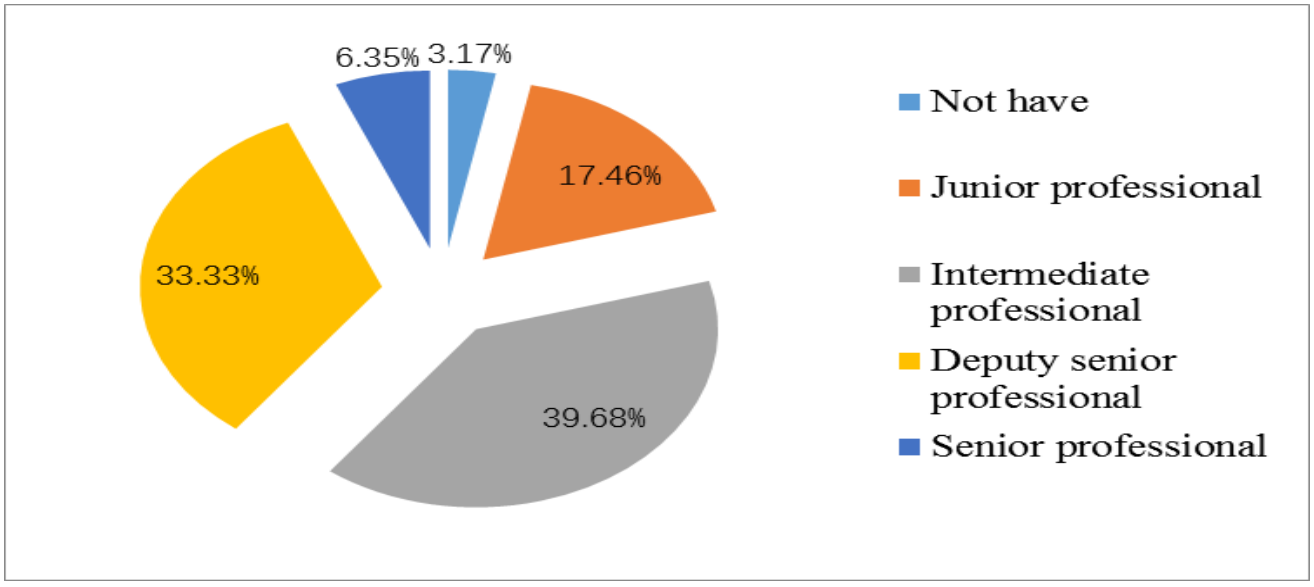

Figure 2.13- Title structure of the respondents.

Source: Prepared by the author

Among the surveyed institutions, 17.46% are in secondary vocational education, 76.19% are in vocational education at the tertiary level, and 6.35% are in vocational education at the undergraduate level. (See Figure 2.14)

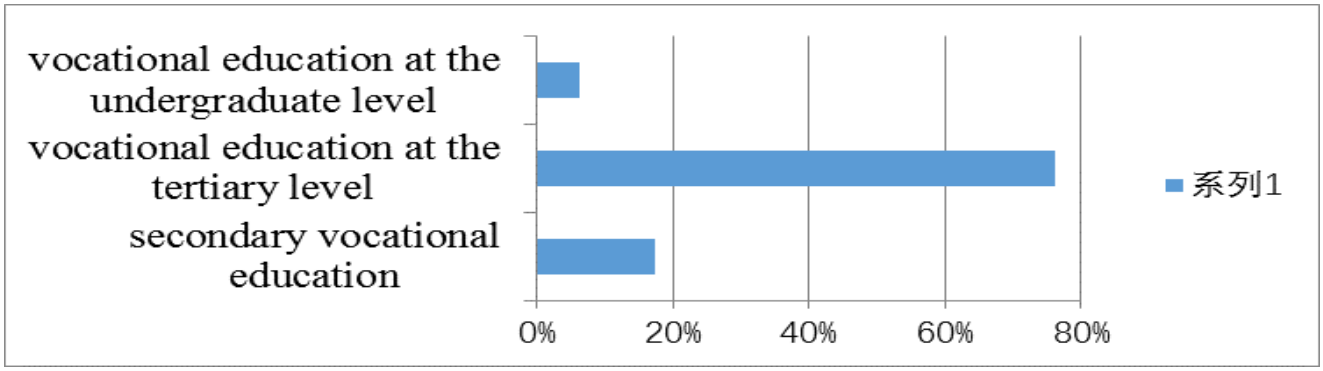

Figure 2.14- Level of surveyed vocational education institutions

Source: Prepared by the author

Among the surveyed vocational education institutions, 42.86% belong to the "Double High" plan for higher vocational education, 6.35% are national demonstration higher vocational education, 11.11% are industry oriented higher vocational education institutions, 1.59% are national key secondary vocational education, and 14.29% are provincial and ministerial level vocational education institutions. This indicates that the overall teaching quality level of vocational education institutions targeted by this survey is at a high level in China. (See Figure 2.15)

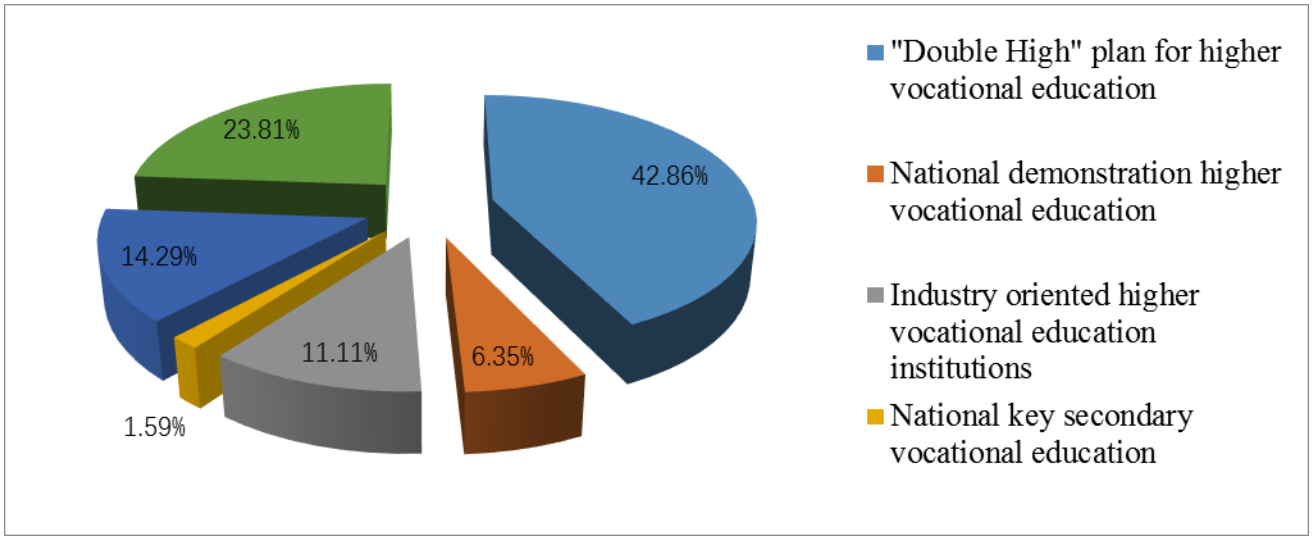

Figure 2.15- Types of surveyed vocational education institutions.

Source: Prepared by the author

The identities of the surveyed personnel are mostly frontline faculty members. Due to the fact that the managers of institutions are generally selected from the teaching staff, they generally have strong teaching abilities. This indicates that managers are not unfamiliar with the teaching of institutions, which is conducive to ensuring the quality of teaching in vocational education institutions. The identities of the surveyed individuals are shown in Figure 2.16.

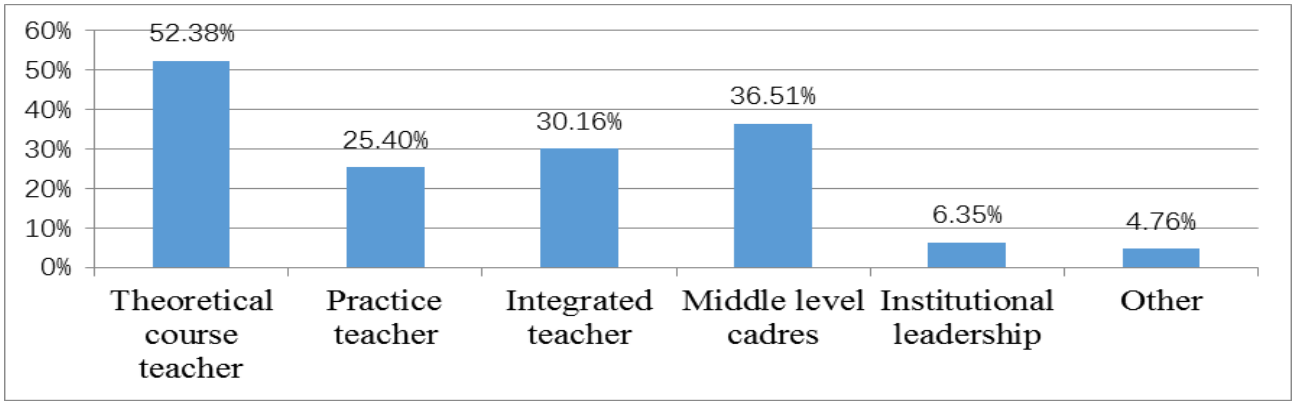

Figure 2.16- Identity type of the surveyed personnel

Source: Prepared by the author

This questionnaire is highly scientific. After reliability analysis of the survey questionnaire, the cronbach coefficients of the questionnaire as a whole and various dimensions range from 0.970 to 0.987, indicating that the questionnaire has high reliability and stability. (See Table 2.4)

Table 2.4- Cronbach coefficient of questionnaire reliability.

Sample Name	Number of samples	Item Quantity	Cronbach
The entire questionnaire	631	69	0.987
MC1	631	10	0.970
MC2	631	10	0.975
MC3	631	10	0.958
MC4	631	10	0.965
MC5	631	10	0.981
MC6	631	10	0.971

Source: Prepared by the author

This questionnaire is compiled based on the actual situation of China's current vocational education, and has been reviewed and assessed with relevant experts through interviews. The questionnaire has been revised according to the experts' revision opinions, which to a certain extent ensures that this questionnaire can reflect the real situation of the current leadership competency of Chinese vocational education institutions, so it has good Content validity. After the questionnaire was collected, validity factor analysis was conducted based on the collected data, and the analysis results were in line with reality. Therefore, this questionnaire reflects the actual situation of different dimensions well. (See Table 2.5)

Table 2.5- Validity Factor Analysis of the Questionnaire on the Competency of Vocational Education Institution Managers.

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Commonality
MC1	0.48	0.53	0.48	0.18	0.13	0.800
	0.47	0.72	0.26	0.04	-0.05	0.810
	0.35	0.83	0.30	0.11	-0.00	0.917
	0.26	0.86	0.20	0.15	0.07	0.869
	0.32	0.82	0.24	0.18	0.04	0.866
	0.21	0.71	0.34	0.41	0.12	0.847
	0.22	0.54	0.63	0.32	0.10	0.851
	0.19	0.61	0.28	0.51	0.30	0.828
	0.22	0.71	0.37	0.34	0.17	0.840
	0.33	0.68	0.31	0.34	0.23	0.843
MC2	0.29	0.62	0.33	0.38	0.30	0.809
	0.27	0.53	0.39	0.47	0.42	0.899
	0.33	0.60	0.46	0.42	0.09	0.865
	0.36	0.44	0.67	0.22	0.16	0.841
	0.53	0.36	0.59	0.20	0.11	0.804
	0.38	0.52	0.61	0.15	0.19	0.848
	0.26	0.68	0.46	0.28	0.23	0.876
	0.34	0.46	0.61	0.33	0.21	0.858
	0.33	0.37	0.72	0.33	0.04	0.881
	0.40	0.37	0.65	0.37	0.10	0.866
MC3	0.60	0.40	0.45	0.16	0.16	0.767
	0.44	0.38	0.69	0.21	0.09	0.876
	0.31	0.52	0.43	0.41	0.33	0.838
	0.35	0.53	0.50	0.42	0.20	0.872
	0.55	0.57	0.08	0.45	0.24	0.895
	0.54	0.39	0.04	0.52	0.06	0.726
	0.57	0.32	0.13	0.43	0.02	0.621
	0.53	0.22	0.21	0.67	0.13	0.850
	0.49	0.10	0.41	0.66	-0.02	0.851
	0.55	0.21	0.32	0.61	-0.00	0.823
MC4	0.30	0.30	0.37	0.71	0.11	0.833
	0.27	0.53	0.30	0.60	0.27	0.877

Continuation table 2.5

MC4	0.29	0.37	0.27	0.72	0.09	0.813
	0.37	0.39	0.58	0.38	0.05	0.772
	0.40	0.45	0.56	0.30	0.20	0.809
	0.48	0.38	0.55	0.28	0.28	0.843
	0.66	0.24	0.19	0.40	0.21	0.728
	0.60	0.25	0.52	0.45	0.04	0.897
	0.64	0.18	0.35	0.50	0.19	0.853
	0.63	0.39	0.37	0.40	0.20	0.886
MC5	0.69	0.35	0.31	0.22	0.33	0.856
	0.65	0.26	0.33	0.20	0.52	0.916
	0.58	0.37	0.30	0.12	0.44	0.778
	0.64	0.32	0.31	0.33	0.44	0.913
	0.67	0.26	0.34	0.35	0.37	0.887
	0.68	0.30	0.49	0.13	0.26	0.872
	0.68	0.37	0.30	0.28	0.34	0.888
	0.69	0.32	0.42	0.10	0.33	0.877
	0.69	0.26	0.44	0.13	0.34	0.870
	0.62	0.23	0.41	0.34	0.25	0.781
MC6	0.81	0.29	0.23	0.14	-0.08	0.815
	0.82	0.15	0.21	0.30	0.00	0.833
	0.65	0.33	0.06	0.33	0.28	0.723
	0.73	0.30	0.30	0.30	0.03	0.799
	0.77	0.25	0.24	0.35	0.05	0.835
	0.62	0.27	0.15	0.55	0.18	0.808
	0.72	0.28	0.28	0.32	0.19	0.808
	0.67	0.35	0.31	0.30	0.19	0.802
Characteristic root value (before rotation)	42.36	3.41	1.87	1.48	1.08	-
Variance interpretation rate% (before rotation)	70.60%	5.68%	3.12%	2.47%	1.80%	-
Cumulative variance interpretation rate% (before rotation)	70.60%	76.27%	79.39%	81.86%	83.66%	-
Characteristic root value (after rotation)	17.01	12.22	9.79	8.32	2.85	-
Variance interpretation rate% (after rotation)	28.36%	20.37%	16.32%	13.87%	4.74%	-
Cumulative variance interpretation rate% (after rotation)	28.36%	48.72%	65.04%	78.92%	83.66%	-
Bart's spherical value	21322.263					-
df	1770.000					-

Source: Prepared by the author

Based on the results of the survey questionnaire, the basic competency of managers in Chinese vocational education institutions can be obtained overall, the majority of participants gave positive feedback on the performance of managers of

vocational education institutions in six dimensions. Among the 60 evaluation questions from six dimensions, 79.39% of the respondents believed that they were " Complete compliance " and " Relatively compliance ", while only 2.83% believed that they were " Complete non-compliance " and " Relatively non-compliance ". This proves that the main managers of vocational education institutions in China have gained recognition from the majority of people in the field of work being tested, This also indicates that vocational education institution managers have a high level of competence. (See Figure 2.17)

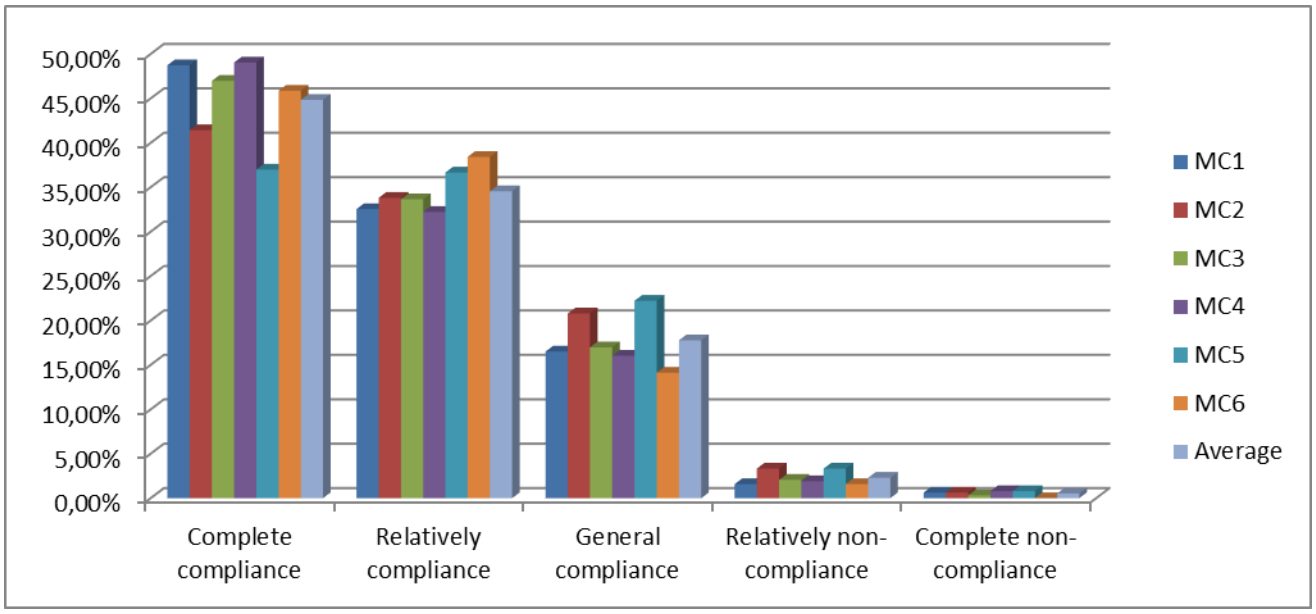

Figure 2.17 - Evaluation of Competence Level of Managers in Vocational Education Institutions

Source: Prepared by the author

From the above figure, it can be seen that although the competence of managers in the tested range has been recognized by most people, there are still quite a few people who believe that the performance of these managers is " General compliance " from the six different dimensions of MC1 to MC6. This shows that there is still great room for improvement in the competence of vocational education institution managers. So in the following analysis, we focus on finding these clues that require strengthening competency. For the analysis and induction abilities (MC1) of managers, the

proportion of " Completely compliant " and "relatively compliant" is relatively high, both exceeding 50%.

Among various abilities, the proportion of participating in teacher curriculum and teaching research(MC1.3), keenly perceiving problems in professional construction and proposing improvement suggestions(MC1.9), providing smooth feedback channels(MC1.2), and participating in adjusting talent training plans(MC1.4) is relatively low, with the proportion of " Completely non compliant" and " relatively non compliant" exceeding 3%. Among them, the proportion of main managers frequently participating in teacher courses and teaching research is the lowest, with the proportion of "completely non compliant" and "relatively non compliant" both exceeding 4%. From a data perspective, the most prominent issue is that there are still some managers who cannot accurately identify the main problems that affect students' learning and growth and correct them in a timely manner. This indicates that as managers of vocational education institutions, their ability to analyze and summarize problems is still an important issue that hinders the improvement of management quality. (See Figure 2.18)

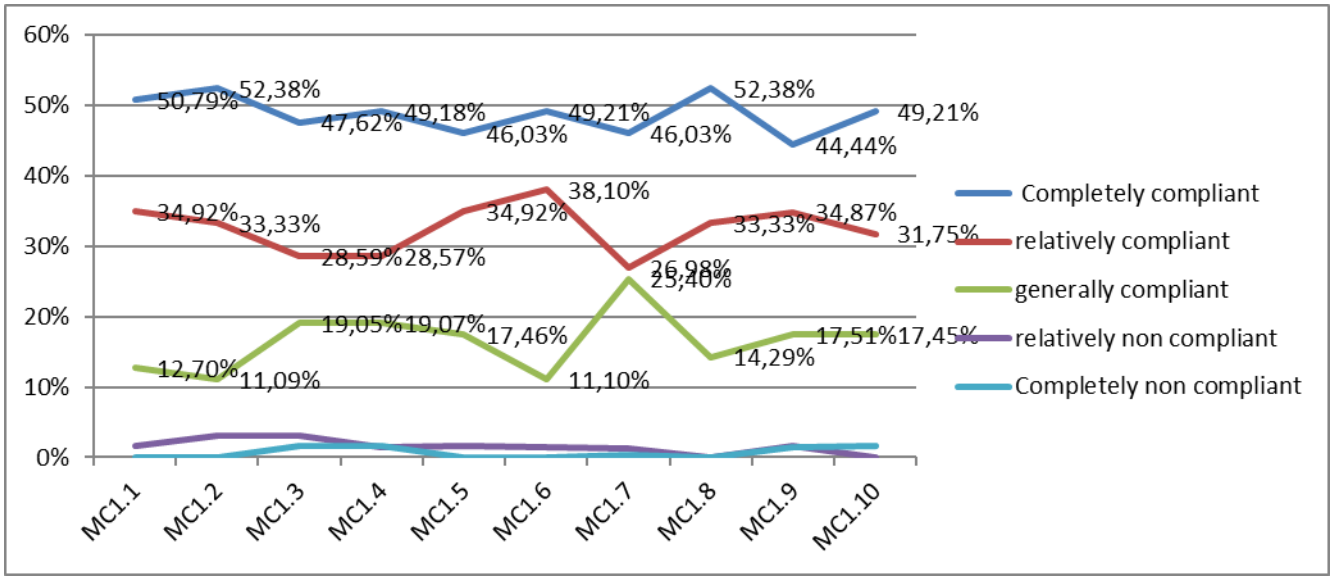

Figure 2.18- MC1: Manager's analytical and inductive abilities

Source: Prepared by the author

Regarding the decision-making and planning abilities of managers (MC2), research data shows that there are serious problems with the division of labor and collaboration among various departments in the organization (MC2.5). In addition, institutions are unable to take timely and effective measures to improve management status based on the opinions and suggestions of students or parents (MC2.9), and managers also have a serious problem of blind decision-making (MC2.8), which also shows a lack of decision-making and planning abilities of managers. (See Figure 2.19)

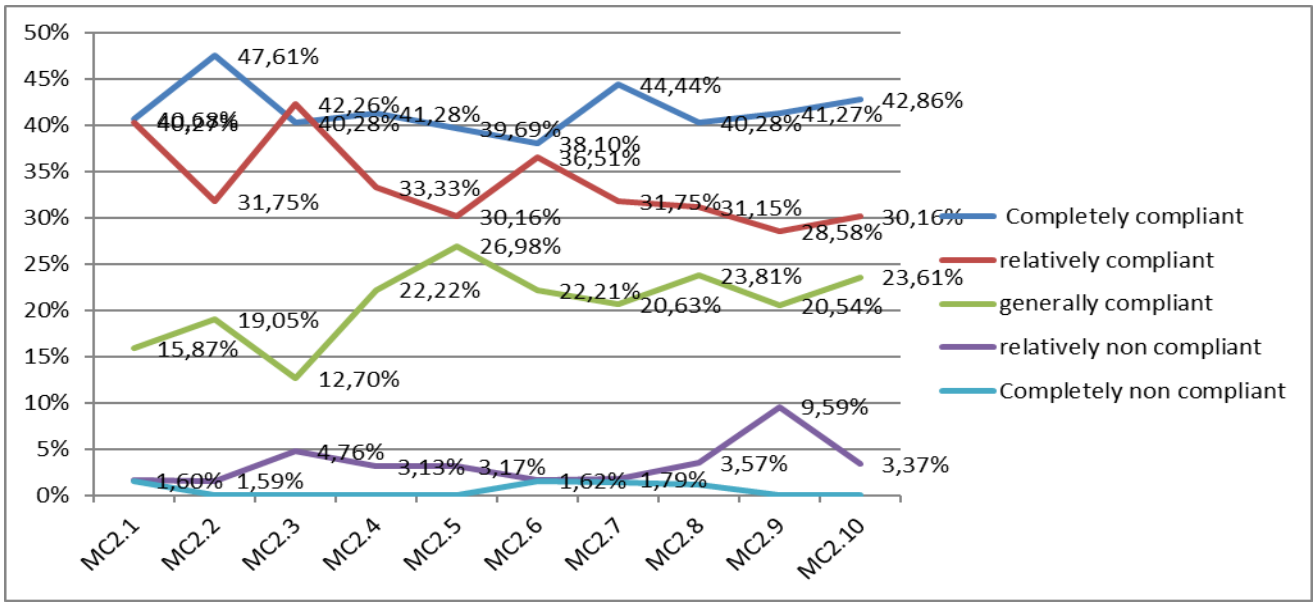

Figure 2.19- MC2: Manager's decision-making and planning ability

Source: Prepared by the author

In the data analysis of manager's communication and organization ability (MC3), it was found that there are many flaws in manager's communication and promotion of work objectives (MC3.2), timely sharing of new concepts acquired by teachers during their further studies (MC3.4), and in addition, managers lack communication with students and are unable to effectively attend various student gatherings (MC3.7). Lack of communication and communication skills often leads to increased subjective arbitrariness in decision-making, There is a disconnect from the essential requirements of management. (See Figure 2.20)

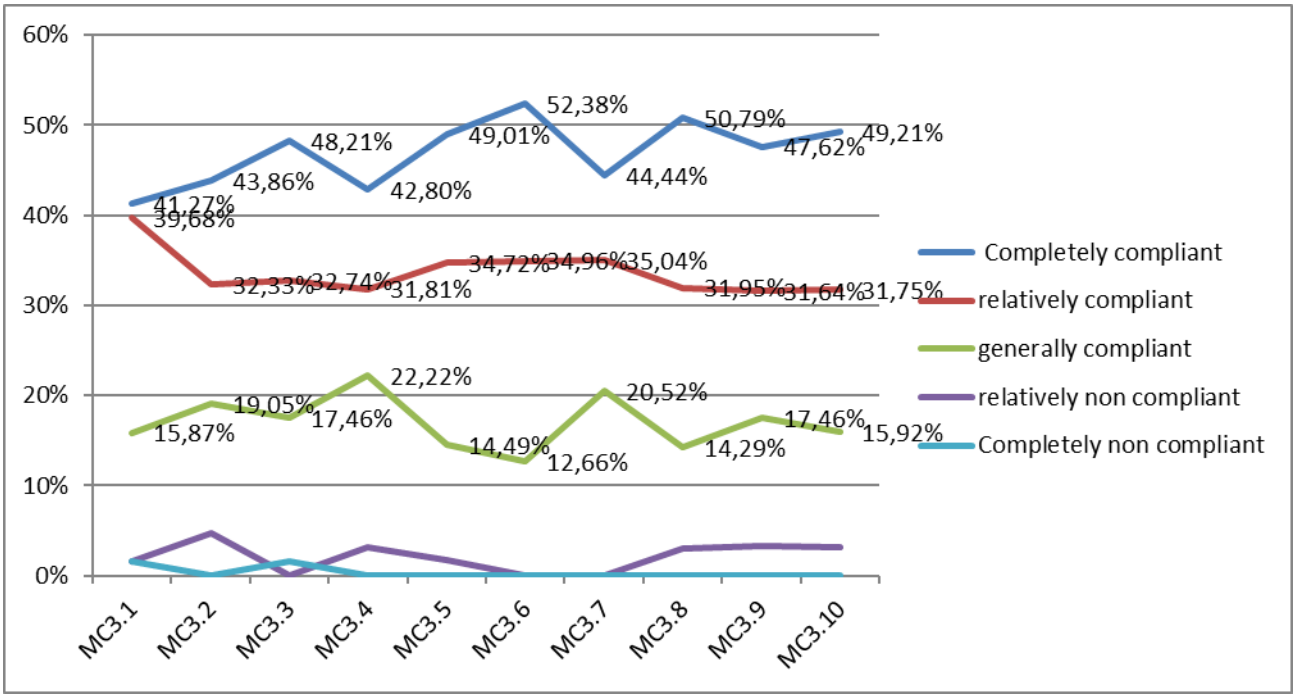

Figure 2.20 - MC3: Manager's communication and organization ability

Source: Prepared by the author

In the research on the ability of managers to lead and demonstrate (MC4), managers have flaws in guiding the correct direction of management work (MC4.8), lack of efficient management styles and methods (MC4.6), and lack Platforms and channels for improving teachers' professionalism (MC4.7). Although the overall direction of efforts has been clarified and clear goals have been set in the management work, due to the lack of leadership and demonstration ability, it is impossible to efficiently promote the work to a higher level through the words and deeds of managers. (See Figure 2.21)

In all evaluations of MC1-MC6, the data indicates that MC5 has the most serious problem, which is the manager's ability to evaluate and inspire. In this test, more than 20% believed that the tested topic was in three relatively negative states: "generally in line", "relatively out of line", and "completely out of line". Even, the negative responses to some topics accounted for 34.92%. This is a very dangerous state, indicating that the relevant managers' abilities under testing have been strongly questioned. The topic with the most serious problems indicates that the management of the organization's business planning is not sustainable, and the existing planning does

not involve everyone (MC5.6), which makes it difficult to achieve consistency in the direction of work and seriously disperses internal synergy.

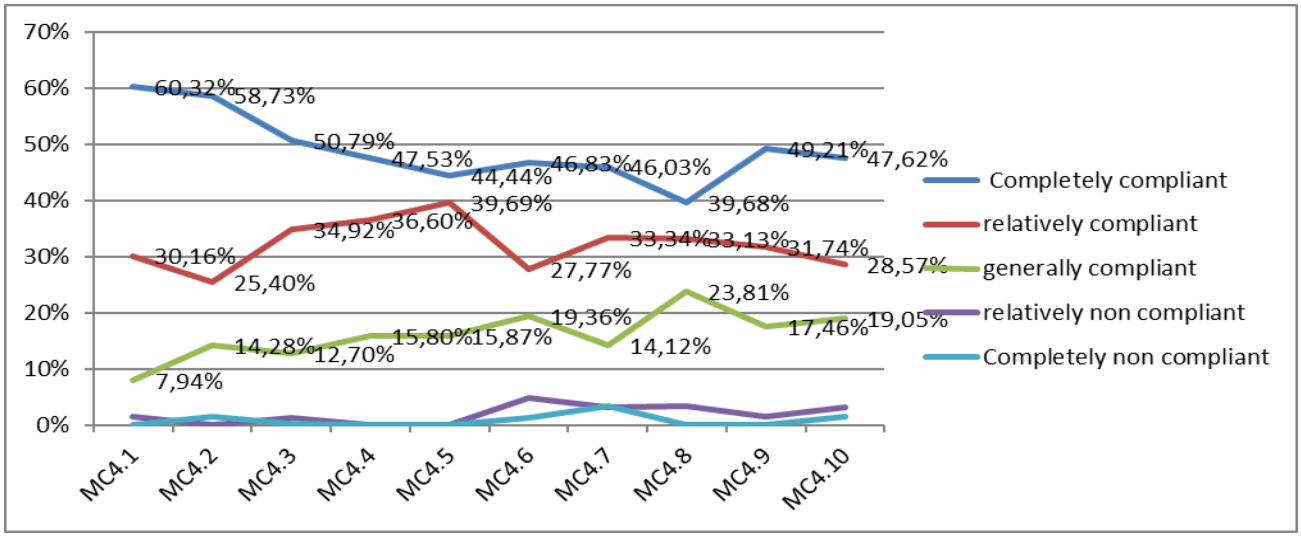

Figure 2.21- MC4: Leadership demonstration ability.

Source: Prepared by the author

In addition, students are not very satisfied with the educational environment, and there has been no systematic change in their attitude towards learning (MC5.10). Managers also appear to be disconnected from practical needs in scientifically guiding personalized career development of teaching staff (MC5.8). The essence of these problems is that managers cannot accurately and scientifically evaluate the environment of vocational education institutions, as well as the needs of faculty and students. Improving the methods of these management problems requires managers to focus on enhancing their self-evaluation and charisma abilities. (See Figure 2.22)

The final evaluation of this survey questionnaire is to assess the core competitiveness of managers (MC6). Most of the participants recognized the core competitiveness of managers. The most prominent issue in MC6 is the questioning of the effectiveness of the use of funds by managers (MC6.1), with some participants believing that managers do not effectively support and ensure the implementation of various work in vocational education institutions. Of course, financial management is the most fundamental and core guarantee element for the good operation of vocational education institutions.

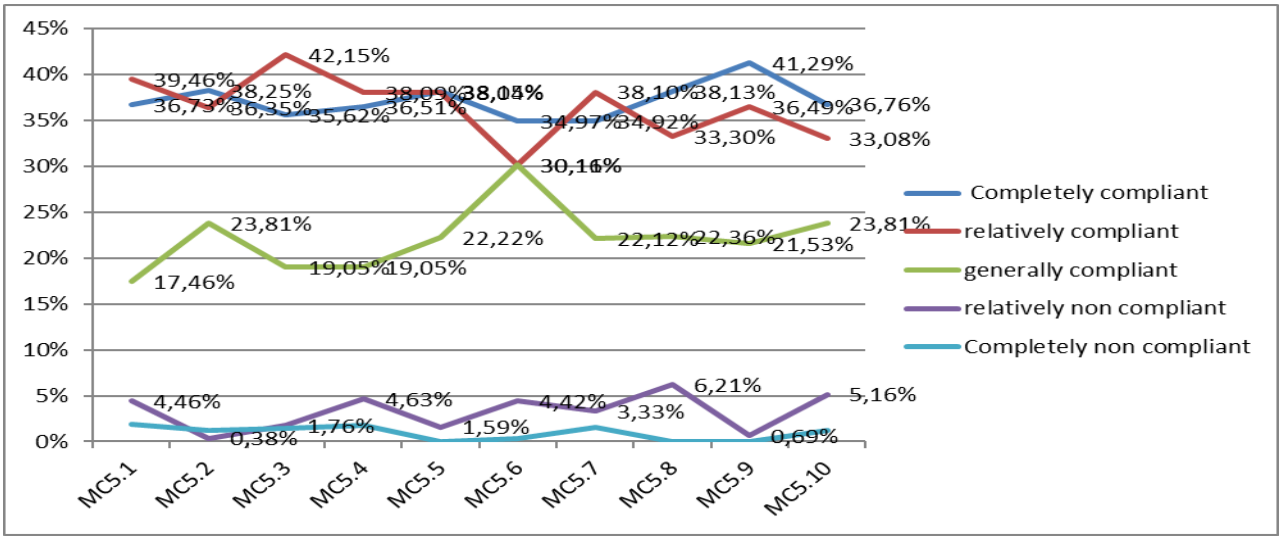

Figure 2.22 - MC5: Evaluation and Inspiration Ability

Source: Prepared by the author

Managers need to work hard to clarify their thinking, improve the pertinence and effectiveness of financial management, and maximize the driving effect of financial operation on the good operation of vocational education institutions. (See Figure 2.23) Through a survey of the daily management work of vocational education institution managers, we have collected and organized the problems with their competence, mainly including the following aspects:

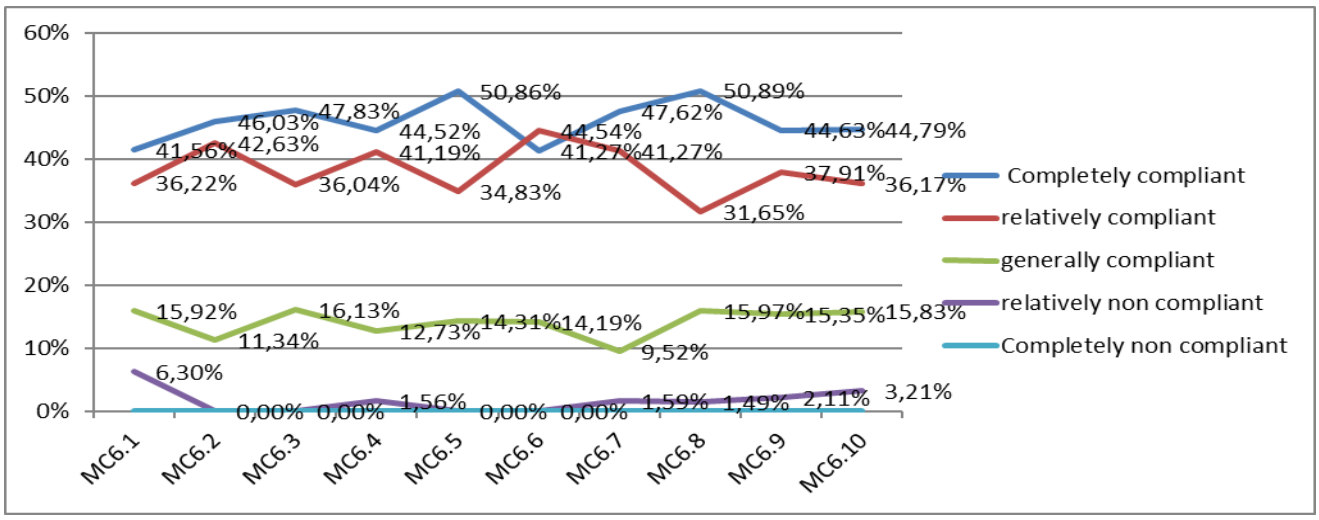

Figure 2.23 - MC6: Core competitiveness

Source: Prepared by the author

First of all, managers of vocational education institutions lack the understanding

of competence and are blindly optimistic about their own winning power. Almost no manager thinks that their own competence is lacking or defective. The competence of these managers plays a crucial role in the construction and development of a vocational education institution, as it directly affects the management level and teaching quality of the institution. Many managers usually adhere to the concept of self righteous in management, and it is difficult to listen to different voices from outside. They act boldly but lack communication and communication. They do not stick to small details, and can not play a leading and exemplary role. Other staff are also unwilling to directly put forward their own opinions and suggestions on the competency of the main managers, which objectively encourages the self righteous Management style of the main managers.(Yang., 2015) Over time, the operation of vocational education institutions will undergo qualitative changes in accordance with the subjective cognition of managers. Insufficient understanding of competence by managers themselves will affect the normal construction and development of vocational education institutions.

Secondly, personal competency deficiencies of managers have had a significant impact on the high-quality operation of institutions. Practice has proven that the root cause of various problems in the management of vocational education institutions is due to the insufficient competence of managers. In China, the decisions of vocational education institutions are mostly made by the principal's office meeting. But before a topic enters the principal's office meeting for research, has there been sufficient and scientific argumentation? Is the process of argumentation standardized and reasonable? Will there be a certain degree of blindness in the proposal to vote on this issue within a short meeting time? In fact, in order to ensure the vitality of vocational education in China, vocational education institutions have a great deal of discretion. However, this discretionary power often results in various problems in the decision-making process due to the insufficient competence of managers, and the decisions made do not meet or fully meet the requirements of objective reality. This leads to a significant waste of financial, material, human, and administrative costs, resulting in the insufficient and efficient utilization of valuable educational resources.(Li., 2015)

Finally, the survey confirmed that managers have many deficiencies in understanding the competence of lower level management cadres. The daily work of vocational education institutions involves a wide range of tasks, including enrollment promotion, education and teaching, school enterprise cooperation, ideological and political education, professional construction, entrepreneurship education, training and employment, and logistics support. This requires managers of vocational education institutions to have an objective and accurate understanding of the competence of lower level management cadres when carrying out personnel division, achieve scientific coordination, employ their talents, and thus form the competence of the entire institutional management team. In real management work, there is often a problem of disunity in the management team. Some individuals who lack professional literacy and ability are assigned to important management positions, which has a significant impact on the work of their department. This has caused problems in the competence of the entire management team of vocational education institutions, and also fully demonstrates the lack of understanding of the competence of lower level management cadres by managers.

Based on the research and analysis of existing problems, we believe that the strategies for vocational education institution managers to enhance their competence are: firstly, at the national policy level, it is necessary to allow managers to have a certain level of authority that is conducive to the development of vocational education institutions themselves. Major issues that affect teaching quality should be resolved in a timely manner, and relevant powers should be appropriately delegated. For example, the independent evaluation of professional titles and the employment of employees can reduce the constraints of relevant systems or policies when managers carry out their work.

Secondly, administrative departments at all levels should reduce interference with the normal work of vocational education institutions, and should not conduct inspections, inspections, and evaluations of vocational education institutions at will. They should not randomly select staff from relevant vocational education institutions, create a good educational and teaching environment for vocational education

institutions, and provide organizational support for managers to implement standardized management.

Thirdly, managers of vocational education institutions should strive to enhance their own competence. Managers of vocational education institutions should strive to enhance their competence in six aspects to meet the requirements of vocational education management for their own qualities and abilities. These improvements mainly include the following:

Ability to analyze and summarize. In today's information age, the generation, content, and quantity of information are exponentially increasing. This requires us to continuously improve our personal analytical and inductive abilities. After analyzing and refining information, we can make accurate judgments based on the summarized elements, accurately grasp the essence of the development of things, and provide a basis for better work. The management of vocational education institutions involves a wide range of tasks and is complex. In normal work, a series of various problems and contradictions often arise, or numerous new situations arise. Excellent managers are often able to unravel the root causes of these complex problems, identify the main contradictions, and summarize the correct methods to solve them, thus efficiently completing management work. Improving the analytical and inductive abilities of managers requires them to repeatedly hone their work skills, constantly analyze and summarize various matters in different environments, problems, and situations, delve deeper into the underlying principles and internal logic, rearrange and combine them according to certain standards, and make things more logical, in order to identify the underlying laws and extract key points, experiences, the content of regularity and directionality serves as the basis for subsequent work decisions.

Decision planning ability. Managers of vocational education institutions often face challenges such as planning, decision-making, and risk assessment, which require them to possess relevant knowledge in order to make correct judgments. And knowledge related to planning, major matter decision-making, risk assessment, time management, etc. are all explicit knowledge. As long as we strengthen learning, gradually master various strategies and control emotions proficiently, we can ensure

that we are in the most suitable and effective state, thereby ensuring the most appropriate management.(Zhou., 2018) American management expert Hackman found through research that "poor work organization leads to negative emotions such as setbacks, attacks, anxiety, personal discomfort, and even resistance to society among employees." Inefficient management institutions often cause serious work anxiety for everyone in these institutions, which is a major management problem that all managers should first avoid.

Communication skills. It is very important for vocational education institutions to build a harmonious educational environment, which is an important part of doing a good job in vocational education. On the one hand, managers of vocational education institutions face a group of students with relatively poor academic performance, many of whom have not yet developed good learning habits. When teachers face these students with relatively poor learning abilities, they are very likely to feel frustrated, which in turn leads to abnormal psychology that affects the quality of teaching. As a manager of vocational education institutions, it is necessary to have an understanding of the characteristics of the student community, care about the growth of students, pay attention to the potential frustration that teachers may experience in their teaching work, pay attention to maintaining the mental health of teachers, become a disseminator of positive energy, and shine warm sunshine into the hearts of every student and teacher.

In addition, vocational education institutions require managers to communicate with administrative departments and individuals at all levels in terms of policy funding, school enterprise cooperation, training and employment, and professional development due to educational needs. Their expression and communication skills are crucial. Managers of vocational education institutions should strive to cultivate themselves as mature and capable language controllers, striving for a more favorable environment and space for the construction and development of the institution.

Leading demonstration ability. The famous American educator Ernest.L.Boyer said, "Without classroom teaching experience, it is impossible for managers to exercise their leadership positions. We specifically propose that the manager training model

should follow the teacher training model. If Without being thoroughly rooted in the realities of classroom instruction, administrators will continue to feel uncomfortable and unfulfilled in their educational leadership roles."(Chen., 2016) Therefore, the requirements for the leadership and demonstration ability of managers of vocational education institutions are very high. On the one hand, it requires the managers of vocational education institutions to be proficient in teaching and master the knowledge of pedagogy, psychology and other disciplines. They are not only experts in teaching, but also able to guide young teachers and build a community of teacher growth. On the other hand, managers are also required to promote professional construction and promote teaching reform through professional construction.

Improve the ability to evaluate and inspire. Since the managers of vocational education institutions are always the focus of the institution, how many teachers and students are paying attention to the words and deeds of the managers, which are subtly affecting teachers and students. Therefore, managers of vocational education institutions should strengthen the cultivation of the ability to inspire and symbolize, and have the ability to focus the attention of all people in vocational education institutions on important matters of the institution.(Zhang., 2017) Managers need to set work goals for the institution. This is an important job for managers of vocational education institutions, and it is an inductive effect that triggers the consensus and dedication of all teachers and students. At the same time, managers should have the ability to accurately evaluate people and things. This evaluation ability should be a sincere, objective, and rational evaluation that teaches people to improve. Through this ability, managers can promptly correct the existing problems in the organization, encourage and spur all teachers and students to work together to do a good job in the various tasks of the institution.

6. Improve core competitiveness. The managers of vocational education institutions should devote themselves to the cultivation of core competitiveness. The construction of a first-class institution cannot be separated from the human factor, the spirit of the human being, and the ability of the human being. To a large extent, the core competitiveness of the managers is the core competitiveness of the organization.

Under the influence of the core competitiveness of the managers, the cultural atmosphere of the organization is closely related to the core competitiveness of the managers, and the cultural atmosphere of the organization is the core competitiveness of the organization. The spiritual norms followed by all teachers and students.(Zhou., 2018) This norm reflects the most central and meaningful values in their work and study. Only through the correct and advanced cultural construction, all teachers, students and workers can be condensed into a community of thought, can the construction and development of the whole institution be brought into full play.

Conclusions to section 2

This section analyzes the current situation of personnel training and management innovation in vocational education in China. It mainly includes the following contents:

1. The personnel management work of China's higher vocational education institutions is led by the party committee of the institution, and the personnel department is responsible for the specific implementation. The personnel departments of most units work together with the Party Committee Teacher Work Department to ensure that all aspects of the personnel management and teaching process conform to the correct ideology. Their personnel management closely follows the country's reform and development requirements for higher vocational education institutions, and conducts various political, business training and professional ethics training for the staff of the institutions to continuously improve their work standards. By designing a scientific and reasonable performance evaluation system and establishing an evaluation system for evaluation and evaluation, people with the same job attributes can participate in the work, so as to achieve good competition. Personnel management personnel are also responsible for giving employees corresponding remuneration and bonuses based on the basic quality of various employees, as well as the annual assessment and assessment results, so as to achieve the purpose of "rewarding and punishing the fittest".

2. Generally speaking, the personnel management of China's higher vocational education institutions is full of vitality. However, there are also problems such as

limited talent flow, passive management, unreasonable composition of human resources, lack of scientific innovation in personnel management system, and insufficient degree of informationization of personnel management. In the future, the personnel management innovation of China's higher vocational education institutions will focus on establishing the "people-oriented" management concept, further optimizing the personnel management structure, innovating and reforming the personnel management system, vigorously improving the level of personnel management informatization, and continuously improving the comprehensiveness of personnel management staff. ability, and further improve the work quality and work efficiency of vocational education institutions through performance appraisal and personalized salary.

3. In order to adapt to the rapidly changing economic and industrial situation and better promote the development of the national economy, the state strongly supports the development of vocational education and has issued many policies and measures to support the development of vocational education, emphasizing the importance of vocational education at the macro level. The operation mechanism carries out precise regulation and guidance. The average annual enrollment of 28 million students has injected strong impetus into the country's economic development. The economic scale of up to 18 trillion US dollars has greatly supported the development of vocational education. It is a strong force for the high-quality development of vocational education. A strong economic foundation and important support have promoted the development of vocational education to a higher level.

4. The development of vocational education in China has achieved a high degree of coupling between educating people and investing in human capital. Vocational education continuously transports high-quality technical and skilled talents to corresponding regions, gradually becoming an important factor in promoting economic development, ensuring the effective implementation of economic development strategies, promoting the continuous improvement of the soft environment for China's economic development, and accelerating China's industrial structure. The optimization and upgrading of the system realizes the rapid transformation driven by innovation, and also provides strong support for the country's poverty alleviation projects.

5. Chinese vocational education can improve the level of multi-subject coordination and co-governance, adhere to government guidance, enhance the effectiveness of industry organization guidance, continuously promote the role of enterprises in vocational education personnel training, and strengthen the independent execution of vocational education institutions. Improve the level and ability of Chinese vocational education and economic interactive development.

6. We believe that the competence of managers of vocational education institutions in China can be divided into six levels: analysis and induction ability, decision-making and planning ability, communication and organization ability, leading demonstration ability, evaluation and inspiration ability and core competitiveness. Among them, the ability of analysis and induction, decision-making and planning, communication, and leading and demonstration ability are called basic leadership abilities, while the ability to evaluate and inspire and core competitiveness are called excellent leadership abilities.

7. The results of the questionnaire survey show that the managers of Chinese vocational education institutions have been recognized by most people in the tested work fields, which proves that the managers of vocational education institutions in China have a relatively high level of competence, which also explains China's The phenomenon that vocational education has been fully and rapidly developed at present.

8. By analyzing the problems existing in the competency of managers of vocational education institutions in China, and according to the competency model of managers of vocational education institutions in China, it is proposed to analyze and summarize ability, decision-making and planning ability, communication and organization ability, leading and demonstration ability, evaluation and appealing ability and Strategies to improve the six aspects of core competitiveness and enhance competency.

SECTION 3.

PROSPECTIVE DIRECTIONS OF THE INNOVATIVE PERSONNEL MANAGEMENT SYSTEM IN VOCATIONAL EDUCATION INSTITUTIONS OF CHINA

3.1 Modeling of the innovative personnel management system of vocational education institutions

For vocational education institutions, teaching quality is the core competitiveness of vocational education institutions and an important force to promote local economic development and progress. The prominent teaching dominance of teachers in vocational education institutions is a key factor affecting the quality of education in vocational education institutions. Therefore, drawing on the experience of foreign developed countries and combining with its own national conditions, China has made beneficial attempts to reform and innovate the personnel system of vocational education institutions, and has achieved great results, playing an important role in improving the level of vocational education teachers. But at the same time, the results of vocational education still cannot meet the needs of rapid economic growth, and the innovation of personnel management in Chinese vocational education institutions is still insufficient. We still need to propose new strategies for the innovation of personnel management system.

Under the global integration pattern, the competition in various industries is becoming more and more fierce, and the demand and definition standards for talents are getting higher and higher. Especially in the high-end manufacturing industry, there is an urgent demand for talents with high-end technical capabilities. Under such an environmental background, the cultivation of high-tech talents also puts forward new requirements for the construction of teaching staff, which is also an important content of personnel management in vocational education institutions. Innovating the personnel management system of vocational education institutions can promote

teachers' leading functions to a greater extent, so as to output higher-quality teaching and education services, contribute to further economic growth, and realize the optimal allocation of human resources, optimize and maximize the utility of human resources.(Zhu., 2020)

Objectively speaking, some countries in Europe and the United States and Japan have fully guaranteed the development of vocational education due to their previous economic development, after continuous innovation and exploration, these countries have formed a relatively scientific and effective personnel system. Many experience And practices are worth learning from.

The United States is one of the countries with the most developed education in the world, the power of education in the United States should not be underestimated. In its long-term development and precipitation, it has established a huge team of world-class professors and scholars. The theories and achievements it has developed and created have made the world attention. One of the most important reasons why American education can be so successful is that it has established a relatively complete personnel management system. It is a rigorous and flexible operating mechanism in selecting, employing, educating, and retaining personnel, which is worth learning from. Specifically, vocational education in the United States is not managed by the federal government, but is exercised by the state governments independently and autonomously. At the same time, the government delegated more management authority to the board of directors of vocational education institutions, which realized the "personalization" of vocational education. These vocational education institutions mainly adopt a socialized approach to recruit teachers, which ensures the high applicability of the personnel system to the needs of the actual situation. In addition, looking at the vocational education in the United States, a very strict teacher employment system has been established, with the tenure-track system as the core. Teachers are required to go through 6-7 years probationary period before they can obtain tenure-track qualifications. The approval process generally includes individual The five links of application, department review committee review, school review committee review, school academic committee review, and the principal's ruling and

reporting to the state education committee for approval effectively guarantee the quality of talents imported from the source. In addition to the above, under the framework of the American vocational education personnel system, a diversified evaluation model is also adopted, which specifically includes teaching, scientific research, social services, and employment.

Influenced by Confucian culture, Japan also attaches great importance to the development of education, focusing on the cultivation of innovative and high-level pioneering talents, and has established a strict personnel system. According to the relevant provisions of the "School Education Law" promulgated by Japan, in order to review important matters, schools must set up relevant teacher review agencies to ensure that the confirmation of important matters in schools meets the requirements of objective reality. In 1951, Japan promulgated the "Industrial Education Promotion Law", which made specific provisions on the purpose of vocational education, national tasks and state financial subsidies for vocational education; in 1958, the Basic Law of Vocational Education "Vocational Training Law" was promulgated. From the 1960s to the 1990s, in response to the new requirements for vocational education raised by social and economic development, the "Vocational Training Law" was amended several times, and corresponding laws were formulated for each type of vocational education institutions.(Luo., 2006) Japan attaches great importance to the role of teachers in vocational education, and introduces and manages teachers through measures such as practical teacher introduction and training methods, systematic laws and regulations, and continuous improvement of salary standards and welfare benefits.(Zhang., 2021) After the corporatization reform, national schools, including universities, introduced a series of institutional tools such as performance evaluation, annual salary system, tenured teaching, and cross-employment, and completed the transformation of teaching positions in colleges and universities from a stable guarantee type to a mobile competition type.(Bao et al., 2021) In terms of the recruitment process of teachers, the personnel management system of Japanese vocational education institutions is also quite strict. There are corresponding requirements for the applicants' education background, work history, teaching and

research level and achievements. Looking at Japanese vocational education institutions in recent years In the teacher recruitment notice, the basic requirements for teachers are to have a master's degree or above and have certain practical or research achievements. Many positions require applicants to have a doctorate. For example, Toyama's 2022 public recruitment of teachers requires a doctorate And obtained the qualification of third-level sea technician or above. At the same time, similar to the school personnel management structure in the United States, Japan basically adopts the self-government model of the teachers' association, with an internal administrative agency that is only responsible for implementing the decisions of the teachers' association. In addition, the personnel management of Japanese vocational education institutions has also carried out beneficial explorations of market-oriented reforms, and teachers rely more on their own abilities to participate in market competition.

Germany has strict regulations on teachers engaged in vocational education. Teacher recruitment adopts open recruitment. Teachers of cultural theory courses must be university graduates and have received certain professional education and teacher training to master educational theory. Teachers of practical teaching must be technical experts who master educational theory. Teachers of both theoretical and practical courses must pass the prescribed qualification examinations in order to obtain teacher qualifications. Usually, teachers in vocational education institutions are mainly divided into two levels: teachers and teacher assistants. Under normal circumstances, only one teacher is assigned to each lecture, and they enjoy the benefits of civil servants until they retire at the age of 65. Among them, the ranks of teachers include three levels: C2, C3, and C4. As the levels increase, they have more resources and can enjoy more favorable wages, pension subsidies, and social security services. On this basis, under the framework of the personnel system of German vocational education institutions, teachers have a high degree of autonomy and control, and undertake different responsibilities and tasks according to the different courses taught. The German teacher promotion system is strict. Professors are appointed from among the teachers of the institution, and teachers with more than five years of teaching practice experience are required to be eligible to apply for college professors. After an

18-month probationary period, the status of tenured professors can only be granted . In addition, generous welfare benefits correspond to strict job promotion procedures. In principle, teachers cannot be appointed to promotion positions in the same school. Therefore, the career development path of teachers in German vocational education institutions is full of uncertainties and uncontrollable forces. However, this move has promoted the formation of the habit of lifelong learning among teachers, but it has also caused the loss of young teachers to a certain extent. Finally, German vocational education institutions have also established a diversified teacher construction system. There are a large number of part-time teachers outside the school, and they are appointed as visiting teachers or honorary professors, which have supplemented the professional team and strengthened vocational education. Institutional faculty.

Although the personnel management of vocational education institutions in China has been greatly improved, there are still some problems due to multiple factors. Drawing on the analysis and enlightenment of the personnel system of foreign vocational education institutions, and combined with the actual situation of personnel management in Chinese vocational education institutions, we put forward the following reform paths in a targeted manner:

The construction of the personnel management system of Chinese vocational education institutions should be adapted to local conditions. Throughout the history of the development of countries with developed vocational education in foreign countries, the construction of personnel systems has shown its own characteristics to a certain extent, and has carried out innovations and changes with the progress of the times and actual needs, thus ensuring that the national conditions of the country applicability. For example, the United States adopts the "board governance" model, which reflects the color of the modern enterprise system. In Japan, however, the management mode of "Governance by the Professors' Association" still retains the shadow of traditional culture. As far as the personnel management of vocational education in China is concerned, while fully learning and drawing on the advantages of foreign personnel management systems, it is also necessary to closely follow the reality, uphold the basic principle of adapting measures to local conditions, and based on the macroscopic

framework of the socialist rule of law and market economy, innovation and change.(Liu., 2019) To put it simply, on the one hand, based on the macro-guidance of the national economic development strategy, scientifically adjust the personnel management mechanism system of vocational education institutions, decentralize powers appropriately, give vocational education institutions reasonable autonomy, and then promote the optimization of the personnel system. This is to ensure its applicability, feasibility, and effectiveness; on the other hand, on the basis of the above, it is recommended to promote the operation mode of combining the overall planning of vocational education institutions with the leadership of colleges and departments, and the overall framework of personnel system reform planned by the institution, Continue to give vocational education institutions sufficient autonomy to freely make decisions about the appointment and promotion of teachers, and actively accept the supervision of the competent government departments.

Chinese vocational education institutions should further improve the construction of organizational system. Under the trend of further development of the Chinese economy, the rapid growth of the number of vocational education students is driving the further expansion of the vocational education teacher team. However, this expansion cannot be an unrestricted expansion, otherwise it will easily cause confusion in the personnel management work of vocational education institutions, it is also prone to resource allocation conflicts between various departments, and even leads to a large amount of talent waste, which is not conducive to the healthy development of vocational education. In this regard, drawing inspiration from the personnel management system of foreign vocational education institutions, the future of personnel management work in Chinese universities must strive to break the constraints of identity and staffing, increase social recruitment efforts under the deployment of macro talent strategy, face a wider economic market, continuously inject new "blood", and gradually change the original team structure, creating a brand new image of vocational education teaching staff. At the same time, considering operational costs, vocational education institutions in China should also improve their organizational system, appropriately streamline administrative management levels,

reduce the proportion of administrative personnel, accelerate the integration of similar departments, and thus improve the efficiency and quality of comprehensive services. In addition, it is worth emphasizing that the construction of the teaching staff is an important basis for the sustainable development of vocational education. As an indispensable part of personnel management, it should focus on strengthening the construction of future reserve forces, actively introducing young teachers, and paying attention to the reasonable allocation of human resources. Drawing on the personnel system design of Japanese "teaching assistants" and "associate professors" and German "associate professors", Break the constraints of the original personnel system that suppressed the enthusiasm of young teachers, develop and retain talents.

Chinese vocational education institutions need to further smooth the flow of talents. As early as the 1980s, China began to carry out the reform of the personnel system with the core of perfecting job appointments, and achieved fruitful results. To put it simply, in terms of the access of faculty and staff, most vocational education institutions in China have basically realized the establishment of posts on demand, and are facing a more open and free economic market to absorb all kinds of talents. At the same time, in the practice of personnel management in some vocational education institutions, based on the enlightenment of the personnel system of North American vocational education institutions, beneficial attempts have been made to the "tenured teaching system" and "last elimination system". In addition, many domestic vocational education institutions have also set up academic committees composed of academic experts, and fully participate in the appraisal work such as the appointment and promotion of teachers. But objectively speaking, due to the influence of multiple factors, the development of personnel management in Chinese universities has not yet reached a perfect state. It should be combined with the actual situation and fully learn from the past successful experience of the personnel system of foreign vocational education institutions to design deeper innovations and changes. Specifically, looking at the reform process of the personnel systems of universities in the United States, Japan, and Germany, while retaining a certain percentage of tenure-track titles, they have also gradually developed an operating mechanism system combined with a

limited employment system to ensure excellent The rights and interests of faculty and staff not only make them concentrate on research and teaching, but also form a benign competitive atmosphere, which encourages young teachers to continue to forge ahead, and the two complement each other (Shao., 2019).

The personnel management of Chinese vocational education institutions should innovate the way of training teachers. At present, Chinese vocational education has ushered in the best development period in history. In the process of vocational education development, almost all of Almost all vocational education institutions will face the impact of the change of new and old systems on the stability of personnel. In fact, under the interweaving influence of multiple factors, the actual development situation of Chinese vocational education institutions is greatly different. As the foundation of overall innovation, personnel management reform should be based on maintaining stability, adopt a sub item and step-by-step implementation method, conduct in-depth research on the front line, identify their positioning in the entire field of vocational education, clarify the goals and key points of personnel management reform, and formulate scientific and specific route plans, Seriously put into practice. During this process, with the further improvement and enhancement of China's economic vitality, and the continuous increase in the number of eligible students in China, the number of students in vocational education institutions has shown a sustained growth trend, and the imbalance in the teacher-student ratio has become increasingly prominent. At the same time, due to the limited time and energy of the teaching staff, they cannot fully consider all aspects of education and are easily constrained by daily routine work, making it difficult to conduct in-depth teaching and research. In order to effectively respond to the challenges posed by the growth of student resources and insufficient teaching staff, and to promote the optimization of the teaching staff structure and establish a positive competitive atmosphere, vocational education institutions should adopt a specialized and part-time approach in personnel management practice, widely attracting talents from all walks of life. Of course, this process requires strict adherence to admission procedures, comprehensive assessment

and cultivation of their moral literacy, professional level, personality traits, etc., in order to form complementary advantages with professional teachers.

Personnel management in Chinese vocational education institutions should focus on innovative incentive methods and methods. The most important task of personnel management in vocational education institutions is to enhance the work initiative of faculty and staff. By adopting a series of scientific and reasonable incentive measures to maximize their enthusiasm and initiative, it is bound to achieve twice the result with half the effort. For this, personnel management in foreign vocational education institutions has also given high attention (Du., 2018). It is imperative to adopt a differentiated salary system for faculty and staff at different positions and levels, in line with the general operating laws of the economic market. For example, for national level skill masters with high skill levels, an annual salary system can be chosen, which consists of three parts: basic annual salary, reward annual salary, and other income. Among them, the basic annual salary should match the economic level of the institution itself, reflecting the responsibilities and requirements of the position; The annual salary reward is reflected through special rewards, talent development funds, and other means; Other income, including project performance commission, training and lecture income, etc. For theoretical teachers or practical teachers in the front line of teaching, their salary structure includes three parts: basic salary, Performance-related pay and other income. Among them, the basic salary design needs to be adjusted in accordance with the requirements of relevant national policies and regulations, combined with the actual situation of vocational education institutions; Performance-related pay includes post allowance, class allowance, etc; Other income refers to research task income, public service income, and other benefits awarded by the department. In addition to the above, the design of a complete incentive mechanism system should not only focus on meeting the material needs of teachers, but also demonstrate strong humanistic care. Combining with their personalized needs, spiritual incentives should be given, such as rank promotion, to enhance their sense of honor, achievement, and belonging.

The effective implementation of personnel management in vocational education institutions is very important. As a complex and systematic project, there is still room for optimization in its current development stage. Based on the inspiration of similar personnel systems in foreign countries and combined with the actual situation in China, we adhere to the basic principle of adapting to local conditions, improve the organization, smooth channels, expand the team, and innovate incentives, in order to maximize the value of talents and help vocational education institutions develop better.

Through the above analysis and summary, we have further clarified the innovative ideas for building a personnel management system in Chinese vocational education institutions. There is a significant difference in per capita GDP among provinces in China in 2022. In fact, there are significant differences in the industrial characteristics, economic structure, and regional characteristics of each province, which also indicates that the innovation of the personnel management system of vocational education institutions in China must be tailored to local conditions and conform to their respective industrial, economic, and regional characteristics in order to achieve the best personnel management results. Based on the above objective facts, we propose the following different innovation strategies.

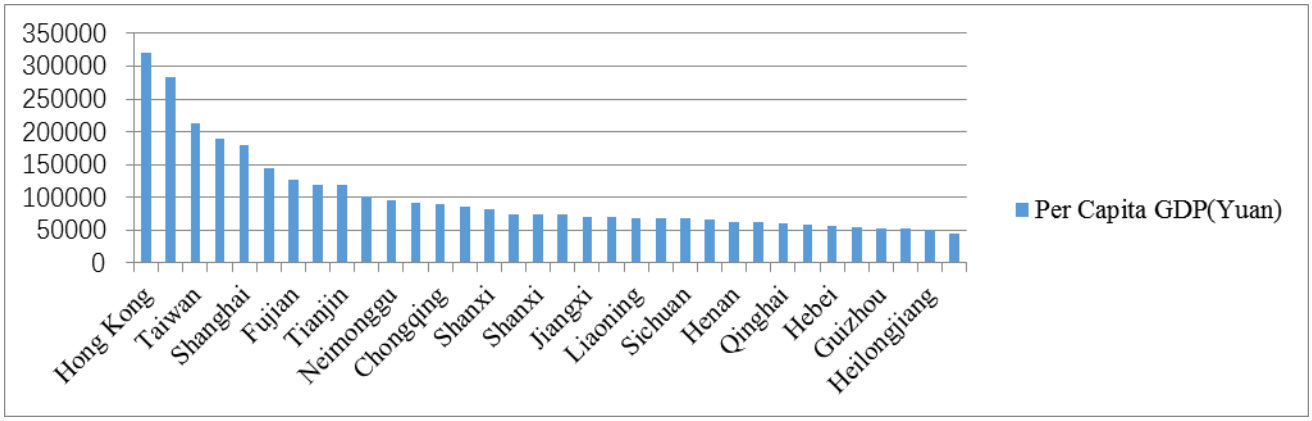

Figure 3.1 - Per capita GDP of various provinces and regions in China in 2022

Source: Prepared by the National Bureau of Statistics

Innovation of personnel management system based on strategic human resource management. Due to the relatively backward economic level in the central, western,

and northeastern regions of China, the stability of vocational education teaching staff is relatively weak compared to developed regions in the eastern and southern regions, which is not conducive to continuously improving the quality of vocational education. The purpose of our proposed strategic human resource management is based on the long-term development perspective of vocational education institutions in the central and western regions. The core idea is to serve the construction, development, and cultivation of the teaching staff of vocational education institutions in the long-term development strategies of vocational education institutions. This is of great benefit to the cultivation of teaching and research management teams in vocational education institutions, as well as the long-term development of vocational education.

Vocational education institutions need to innovate their personnel management system based on strategic human resource management. In terms of job recruitment system, it is necessary to carry out diversified reforms to the traditional teacher recruitment system, optimize organizational structure, and pay more attention to teachers' teaching and research abilities in job settings, professional title evaluation, and other aspects. Through reform, more frontline teaching staff can teach with peace of mind, potential teachers will be included in the core reserve team of teacher resources, and daily training and development efforts will be increased to continuously improve the professional knowledge level and teaching ability of teachers. This kind of reform and innovation places greater emphasis on the development and cultivation of talents, so that the personnel management system can adapt to the requirements of the rapidly developing vocational education environment (Zhao., 2017).

The innovation of personnel management system based on strategic human resource management in vocational education institutions requires further optimization of the cultural atmosphere of vocational education institutions. The creation of a cultural atmosphere, as a subtle ideological guidance, has a very direct incentive and promoting effect on teachers' professional ethics, students' conduct, learning spirit, and other aspects. A good academic atmosphere can inspire a group of ambitious young students in their prime, as well as lay a solid cultural foundation for teachers to devote themselves to education and scientific research (Chang et al., 2015). Therefore, in the

process of innovating and improving the personnel management system of vocational education institutions, more attention should be paid to the construction of cultural atmosphere. By tapping into one's own cultural heritage and combining professional and regional cultural characteristics, advanced educational thinking in the current field of vocational education should be integrated, and unique cultural atmosphere should be developed and cultivated to ensure that the cultural atmosphere can play a correct guiding and motivating role.

The innovation of personnel management system based on strategic human resource management in vocational education institutions requires the construction of an efficient performance evaluation system. An efficient performance evaluation system can provide a scientific, objective, and fair basis for the rational use of talent and the effectiveness of management. The concept of strategic human resource management emphasizes the scientific positioning of talents, by placing suitable talents in appropriate positions to maximize the advantages of different types of talents. In this mode, the human resource management assessment system is relatively flexible. It can not only stimulate the enthusiasm of talents, but also avoid talent misplacement, achieve the best of talents in performance assessment, and improve management efficiency. Therefore, when constructing a performance evaluation system, it is necessary to fully consider the strategic development goals of vocational education institutions, take performance as the core consideration, and develop an effective teacher performance evaluation system and implementation guidelines, in order to make teacher evaluation work normalized, scientific, and standardized (Luo et al., 2017). It should be noted that when determining the assessment method, both qualitative and quantitative assessments should be organically combined. The former has a high degree of subjectivity and ambiguity, while the latter is relatively objective and accurate. Therefore, for general performance assessment, quantitative measures should be taken, while for quality assessment, qualitative measures should be taken and various assessment indicators should be quantified as much as possible to improve the accuracy and objectivity of the assessment.

Vocational education institutions should innovate their personnel management system based on strategic human resource management, and formulate a feasible salary management strategy system based on national policies, economic environment, talent market conditions, and other factors, combined with the actual situation of the institution. Different types and positions of personnel should be treated differently, and their wages and benefits should be tilted according to their contributions to ensure that the salary policy not only attracts outstanding talents from outside, but also retains the core talents of the institution, ensuring the relative stability of the teaching staff. At the same time, based on strategic human resource orientation, innovative performance rewards such as key development performance achievement rewards, secondary unit performance rewards for fulfilling responsibilities, secondary unit quality performance rewards, teacher teaching innovation rewards, and agency service satisfaction rewards can be established to encourage secondary units to obtain rewards by creating key performance and undertaking important work. Performance rewards shall be distributed in accordance with the principles of performance-oriented, superior supervision, and unit autonomy. The principle of two-level distribution of secondary units in vocational education institutions shall be implemented to fully play the main role of secondary units in vocational education institutions and fully mobilize the enthusiasm of secondary units in their work.

Based on the above theory, we have drawn an innovative model diagram for the personnel management system based on strategic human resource management. (See Figure 3.2) Innovation of personnel management system based on improving service level. With the arrival of the new economic era, the construction of high-level talent teams in various vocational education institutions has achieved leapfrog growth, and the team of highly educated and high-level talents is constantly growing. However, even in the economically developed coastal areas of southeastern China, there is a serious problem of talent loss, exposing many shortcomings and deficiencies in personnel management work. At present, many vocational education institutions still adhere to the traditional management concept of institutional attributes in personnel management, such as clear boundaries between managers and those being managed, and work being formalized and centralized management.

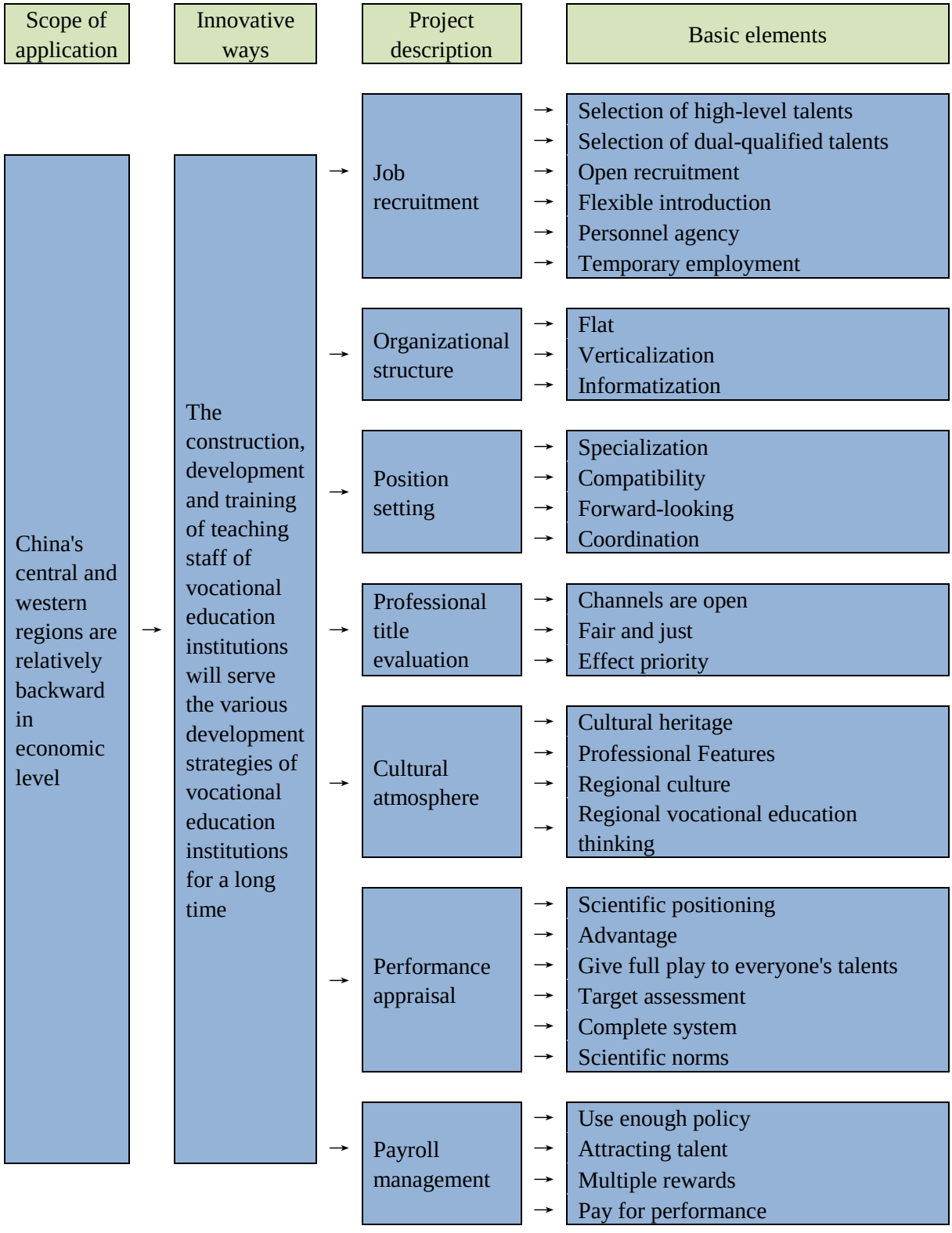

Figure 3.2 - Innovative model of personnel management system based on strategic human resource management

Source: Prepared by the author

The personnel management work is constructed based on a "matter oriented" model, and the subjectivity is not truly and fully reflected, greatly affecting the enthusiasm of faculty and staff to actively participate in work. The traditional personnel management model of public institutions has developed to a bottleneck in the reform and innovation of the personnel system of public institutions, which is out of line with the development requirements of the current era and no longer suitable for modern personnel management models.

Based on the above reasons, the innovation of personnel management system with the concept of improving service level will contribute to the realization of personal value and the overall development of vocational education institutions, and help to achieve unit and individual goals. At the same time, it will effectively reduce the hidden loss of talent and improve the core competitiveness of vocational education institutions themselves.

Firstly, personnel management should strengthen the construction of information digital platforms. If a worker wants to do his job well, he must first sharpen his tools. With the rapid development of today's society, information technology is a leading and important development symbol. The informatization of personnel management has also become the central content of information construction. The modern digital platform of personnel management relies on the network, and through mobile terminals such as computers and mobile phones, as well as multimedia modern information technology, it realizes the extensive collection and processing of various resources in personnel management work, achieving the sharing and utilization of personnel management resources, Promote and complete the magnificent transformation of personnel management work from traditional mode to modern human resource data information management. In this transformation process, the collection, organization, storage, analysis, maintenance, and update of data will play an important role in the decision-making of personnel management work, providing important reference data for the query, statistics, related scientific evaluation, and decision-making of teacher team management in personnel management work. Secondly, we need to vigorously promote the construction of the personnel position

matching system. Driven by the competitive mechanism of the market economy, a large number of job opportunities have prompted many teachers to re choose and reposition their careers and positions, resulting in an increasingly fierce situation of talent loss and turnover. In order to curb the recurrence of this phenomenon, the personnel management system of vocational education institutions should actively develop a high-level talent introduction system to improve the unfavorable situation of talent loss. By optimizing the allocation of talent resources and achieving job matching, while fully unleashing everyone's potential, we aim to form a team that can discover talents and choose the right people to do the right things, establish a stable, efficient, and capable faculty team.

Thirdly, flexible management should be reflected in management methods. The flexible management in the current human resource management model in the new economic era focuses on knowledge workers, and many knowledge-based enterprises have introduced and used it in their work practices, achieving high results. The talent resource management work based on vocational education institutions has similar characteristics to that of knowledge-based enterprises, which is worth learning from and implementing in human resource management work. We adhere to the principle of "people-oriented" and safeguard the legitimate interests of the majority of teaching staff. Reflect humanistic care for faculty and staff during the service process, allowing them to experience the happiness of being served and the sense of belonging at home.

Finally, we should pay attention to the innovation of the "people-oriented" management concept. Adhering to the concept of humanistic care is the only way for personnel management to continuously improve service awareness and service level. Constantly change the way of thinking of personnel management. In addition to actively completing the tasks assigned by the superior, we should start from basic management and fully apply the policy distribution lever to improve the enthusiasm of teaching and management personnel in teaching, scientific research and management; Fully investigate and study the ideological and economic status of teaching staff, constantly explore the management mode to meet the needs of the development of the new situation, and formulate incentive measures; In view of the development of the

unit, the actual situation, ability, family and personal potential, effectively and pertinently solve problems locally, cultivate innovative service mode, and pay attention to the basic management and process management of personnel. Respect the uniqueness of teachers, reflect differences in the design of systems and policies, avoid simple and rough "one size fits all", and strive to seek common ground while reserving differences. Based on the above theory, we have drawn an innovative model diagram for the personnel management system based on improving service levels. (See Figure 3.3)

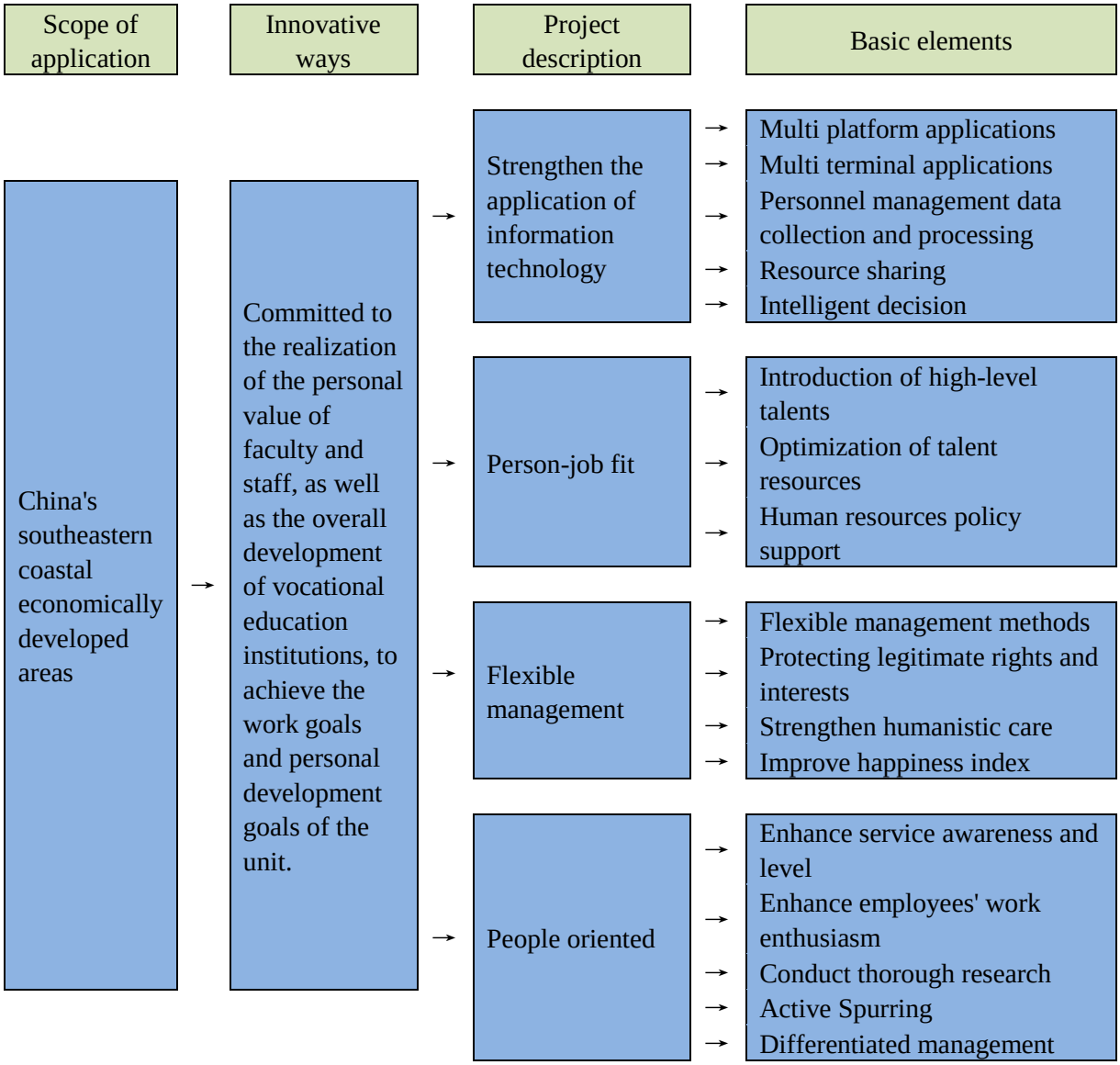

Figure 3.3 - Innovation model of personnel management system based on improving service level

Source: Prepared by the author

Next, we will explore another system innovation. The personnel management system based on the excellent performance management mode will establish the concept of taking benchmarking management as the core, driven by culture, strategy and market, constantly optimizing resource allocation and improving process operation efficiency(Wang., 2013), exploring the construction of personnel management system of vocational education institutions is very suitable for demonstration and key vocational education institutions in all parts of China. Using the excellent performance management mode to build the personnel management system of vocational education institutions and set up relevant assessment standards and systems are of great significance to promote the systematization and standardization of human resources in vocational education institutions. In the process of designing the personnel management system of vocational education institutions using the excellent performance management mode, the following principles should be followed:

The principle of strategic orientation. Strategy is an important part of performance excellence management and the direction of long-term development of organizations. In the excellent performance management mode, human resources are most closely linked with strategy, and human resources must be based on strategy. People are the core competitiveness of an organization, and the realization of organizational strategy cannot be separated from people's initiative. Therefore, the construction of personnel management system is closely related to the organization's strategy. In the process of constructing the personnel management system of vocational education institutions, we must take strategy as the guidance, formulate the human resource management plan according to the national development direction and the strategic planning of vocational education, and design the personnel management system based on the plan.

"Staff oriented" principle. When the concept of excellent performance is used in the construction of personnel management system of vocational education institutions, it requires to adhere to the principle of "staff oriented" in the construction of personnel management system. Teaching staff is the largest and most important resource of vocational education institutions. The efficiency of the use and allocation of this

resource is directly related to the development of the whole institution. Only by paying attention to the development of teaching staff and formulating the personnel management system from the perspective of teaching staff can we truly activate personnel management and achieve the goal of high efficiency and excellence.

Result oriented principle. Performance excellence management emphasizes the focus on results. The results here not only focus on the results themselves, but also on the improvement and feedback of the results. The result oriented idea of excellent performance management emphasizes the dynamic "feedback improvement feedback" cycle process of the results. This is also easy to ignore in the personnel management of vocational education institutions before. In the process of introducing excellent performance management to build the personnel management system, we need to adhere to the result oriented principle and build a set of mechanism that can feed back and improve the results, so as to supervise and control the quality of the operation of the whole personnel management system and ensure the efficiency and effectiveness of the operation of the personnel management system.

In the construction of the personnel management system of vocational education institutions based on the excellent performance management mode, the strategic planning, systematic and standardized construction, attention to "people" and results, and feedback are particularly emphasized. Therefore, the construction work should start from strategy, carry out human resource planning and design, focus on teacher development and result feedback, so as to build an efficient personnel management system.

First of all, the implementation of the whole personnel management system must be guided by planning. According to the theory of strategic management and control, personnel management planning must closely follow the strategy. At present, vocational education institutions must use strategic analysis tools in the development process, analyze internal and external conditions, advantages and disadvantages, and formulate strategies in line with their own development in combination with national policies. The personnel management system of the institution must be planned based on this strategy. At the same time, according to the requirements of the Ministry of

education for the construction of teaching staff in vocational education institutions, the planning must be formulated according to the value idea of "people-oriented". Designing the personnel management system according to the strategic planning can solve the fragmentation of the current personnel management work, sort out the personnel work from the top-level design, and ensure the smooth and systematic operation of the whole system.

Secondly, we should build a teacher oriented, comprehensive and multi perspective attention system. The quality of talent training in Vocational Education Institutions needs to rely on the construction and development of teachers. Therefore, the personnel management system construction of vocational education institutions must serve the teaching staff, "teacher oriented" system construction. In the previous personnel management organizations of vocational education institutions, there was a lack of special attention to the teaching staff, and departments were divided by transactional functions. Such settings could not pay attention to "people". It is suggested that vocational education institutions should set up special departments concerned by teaching staff in the process of human resource management organization structure, such as the teaching staff development center, strengthen the attention to teaching staff through special departments, and truly realize the "teacher oriented" human resource management. (see Figure 3.4)

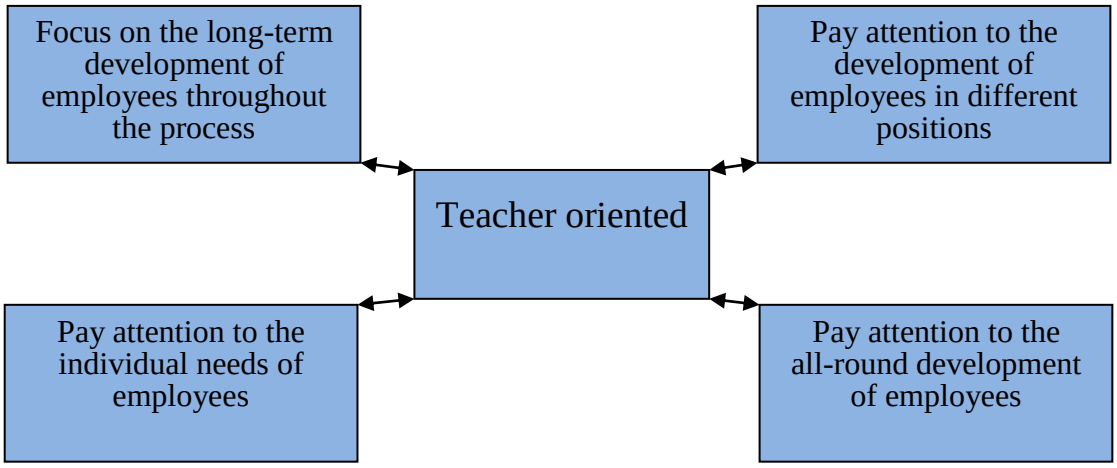

Figure 3.4 - The "four concerns" system for teaching staff development

Source: Prepared by the National Bureau of Statistics

At the same time, the secondary institutions of vocational education institutions should also build a comprehensive system of teachers' attention from the perspective of teachers, and pay attention to the staff on a unified policy. Pay attention to all-round, whole process and personalized demand customization for teaching staff in various posts, build the "four concerns" system for teaching staff development, and truly realize the full coverage of human resource management.

This system breaks the traditional human resource management from the perspective of functional modules, integrates it into the attention system from the perspective of "people", and manages according to the needs of "people", so as to achieve efficient and high-quality human resource management. The construction of a personnel management system based on the excellent performance management model requires the establishment of a performance management system in combination with actual situations, and dynamic assessment and improvement. (See Figure 3.5)

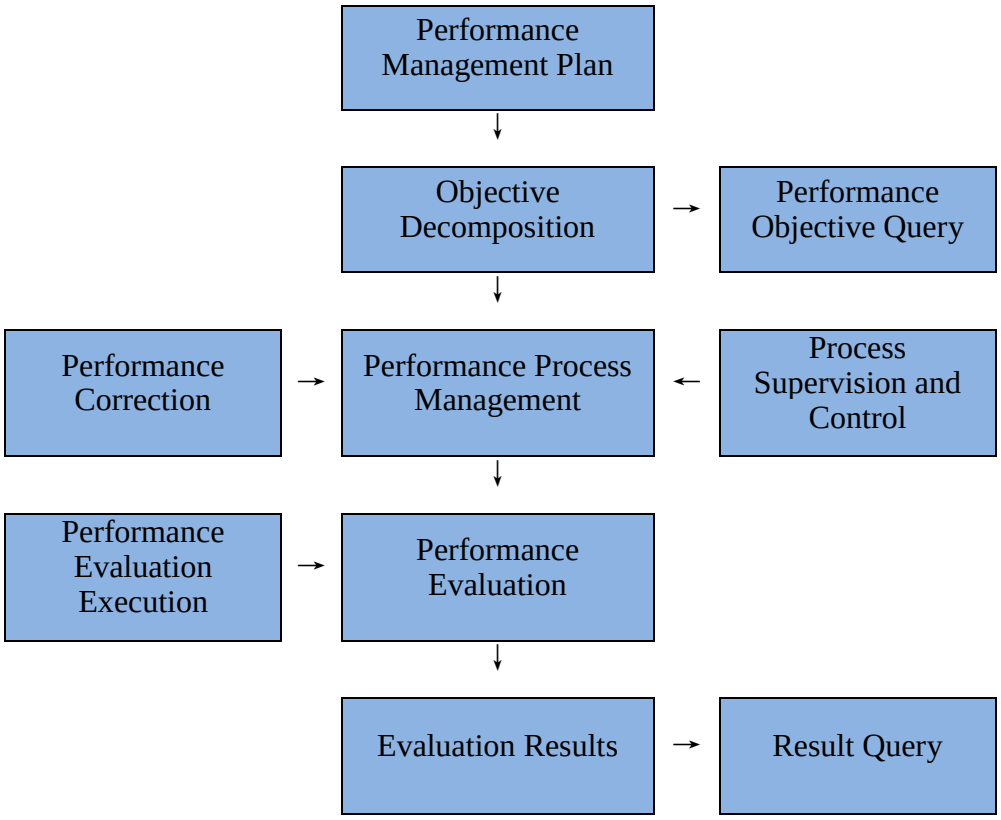

Figure 3.5- Performance appraisal process

Source: Prepared by the author

The traditional performance assessment mainly follows the annual assessment of local governments, and there is no detailed standard for the assessment of various types of personnel. In the excellent performance management model, it emphasizes the pursuit of comprehensive performance improvement and the core role of performance evaluation. The excellent performance model believes that efficiency can only be improved through continuous and dynamic assessment, tracking personnel's work situation, and continuous improvement. It is recommended that vocational education institutions strengthen the role of performance management in the construction of personnel management systems and establish a dedicated performance management department to manage performance management work separately. By constructing a performance management system for faculty and staff, a performance evaluation model that combines qualitative and quantitative evaluation is adopted to consider the quantifiable performance contributions made by various departments and faculty in management and services, education and teaching, student management and services, scientific research, and social services. At the same time, the process performance and actual effects of fulfilling their responsibilities are fully considered, in order to supervise and motivate the work improvement and innovation of faculty and staff. Of course, in the process of performance evaluation, more attention should be paid to the improvement and feedback of performance. Assessment is not the ultimate goal of excellent performance management. Teachers and staff improve their work based on feedback from assessment results, and apply assessment results through corresponding incentive mechanisms to enhance the enthusiasm of teachers and staff, change work attitudes, and work together to pursue excellence goals.

The construction of a personnel management system based on the excellent performance management model must establish a comprehensive feedback mechanism for faculty satisfaction to ensure the high-quality and efficient operation of the personnel management system. The pursuit of excellent results is the goal of excellent performance management. In the past, personnel management work in vocational

education institutions was usually carried out on a "matter" basis, and the results were often evaluated based on completed tasks. This evaluation method that only focuses on things and ignores people makes the event results less efficient and cannot meet the requirements of high quality. The reason why excellent performance management places equal importance on the focus on faculty and results is precisely because only satisfactory results from faculty can achieve excellent and efficient work goals. Therefore, in the process of constructing a personnel management system, it is necessary to consider the satisfaction of faculty and staff as an important link, establish a comprehensive staff satisfaction survey and feedback mechanism, and use the satisfaction of faculty and staff as the final evaluation of the effectiveness of personnel management.

The feedback mechanism for faculty satisfaction should be a dynamic process that must be scientifically demonstrated, such as through questionnaire surveys, literature analysis, faculty symposiums at all levels, performance communication, faculty representative meetings, opinion emails, etc., to comprehensively communicate and communicate with faculty, analyze, evaluate and identify key factors that affect the rights, satisfaction, and enthusiasm of faculty, and sort out the key factors that affect satisfaction of each group. Set up a survey questionnaire based on these key factors and conduct the survey. After the investigation, there should be a timely feedback mechanism to carry out targeted improvements on the issues reported by the faculty and evaluate the improvements in the next year's investigation, forming a circular feedback mechanism of "investigation - feedback - improvement - investigation".

Overall, the goal of excellent performance is to pursue excellence and efficiency. The traditional personnel management model of vocational education institutions can no longer meet the high-quality development requirements of the new era of vocational education. By introducing the excellent performance management model, exploring the innovation and reform of personnel management in vocational education

institutions is of great significance for revitalizing human resources, improving the level of the teaching staff, and promoting the high-quality and efficient development of vocational education. (See Figure 3.6).

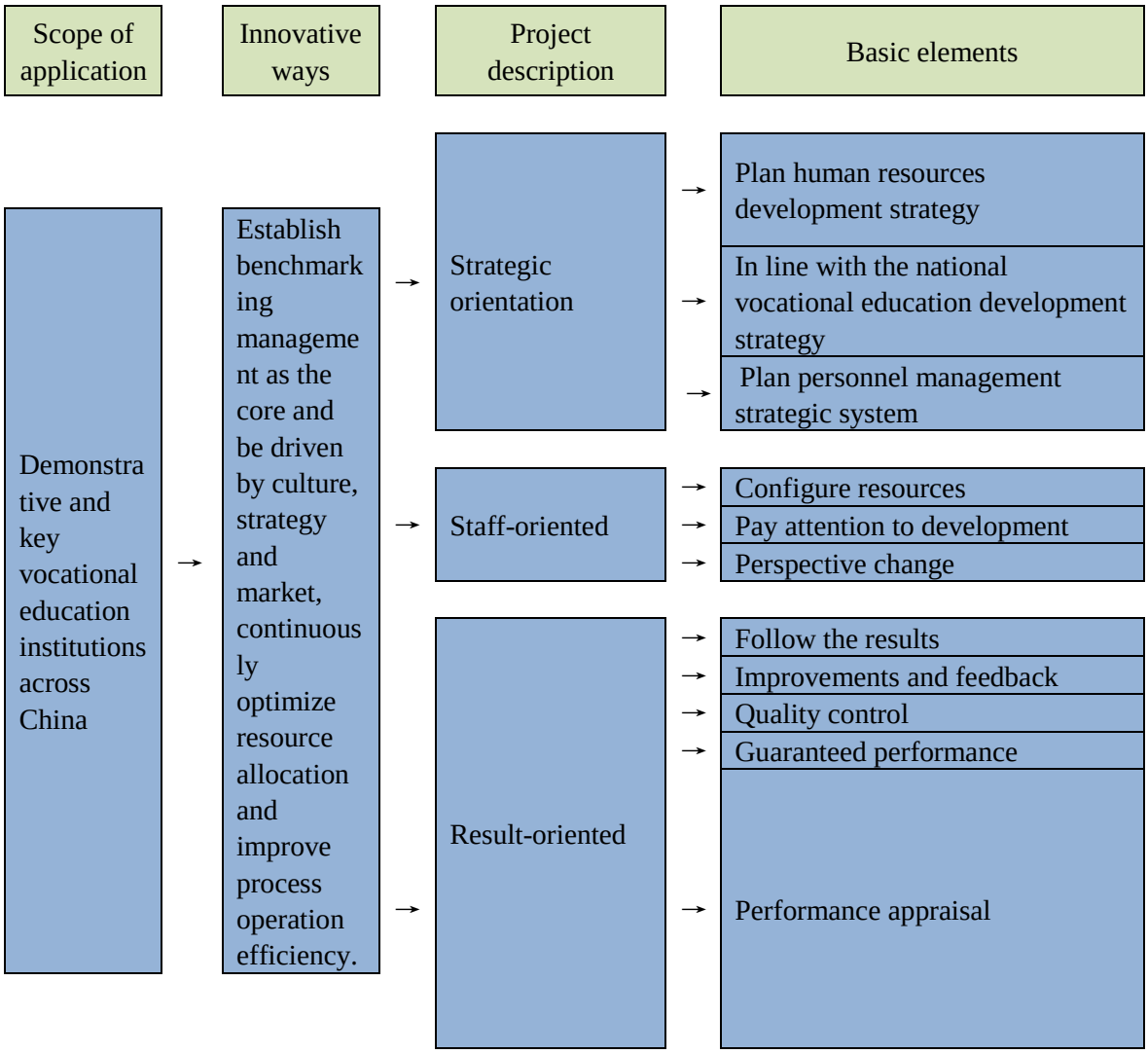

Figure 3.6 - Innovation model of personnel management system based on excellent performance management model

Source: Prepared by the author

Based on the above theory, we have drawn an innovative model diagram of the personnel management system based on the excellent performance management model.

3.2. Improvement of the innovative control system of Chinese professional education within the framework of the strategy of sustainable development of the national economy

With the accelerating development of global economic integration, international and domestic competition is becoming more intense. Despite certain fluctuations in the current world economic situation and a gradual slowdown in China's economic development speed, China still holds a core position in the world economic landscape and remains the region with the most innovative vitality and development potential. Technological development and industrial transformation are currently in a critical period. In 2022, China's GDP remains the second largest in the world. Among the top five economies, China's economic growth rate is the fastest, with a contribution rate of around 30% to world economic growth, and it remains the driving force behind world economic growth. However, China is a country with a lot of human resources, not a country with a strong human resources; China is a country with a lot of education, but not a country with a strong education. The conclusions drawn from relevant research both domestically and internationally are basically consistent. The lack of highly skilled talents is the most critical factor affecting China's transformation into a manufacturing powerhouse. To achieve the goal of becoming a strong manufacturing country, it is necessary to strengthen the cultivation of highly skilled talents, which cannot be separated from the development of vocational education. The coordinated development of modern vocational education and the economy is not only an essential requirement for the attributes of vocational education, but also the practical application of the economic effects of vocational education. In China's vast education system, vocational education has trained labor, improved labor productivity, and promoted economic development. From this perspective, vocational education itself is an important element of economic development; At the same time, economic development also provides material security and financial support for vocational education, and there is an interactive relationship between them. The "Modern

Vocational Education System Construction Plan (2014-2020)" issued by the Chinese government includes 12 key tasks, including optimizing the layout of vocational education service industries and coordinating the development layout of vocational education. In 2022, China revised the Vocational Education Law, indicating the importance China attaches to the development of vocational education and injecting new vitality into the coordinated development of vocational education and the economy.

The logical starting point of the economic effect of vocational education in China is mainly manifested in the following aspects: Firstly, the development of vocational education is a necessary aspect of economic development. In the entire education system, vocational education is one of the industries most closely related to economic development and has a market-oriented nature. Marketability is the fundamental industrial nature of China's current economic sector, emphasizing the decisive role of the market in resource allocation, through market mechanisms, resource optimization is achieved, promoting continuous social and economic development. Vocational education undoubtedly has a market-oriented nature, which is consistent with the market-oriented nature of economic development and is an inevitable result of the mutual influence and interaction between education and the economy for a long time. In the specific operation process of vocational education, market awareness and behavior have been fully reflected. Therefore, in the process of comprehensively deepening reform, it is necessary to follow the laws of vocational education, combine with the actual situation of economic development, and continuously improve the coordination between vocational education and economic development. Vocational education has economic and industrial functions as well as political and cultural functions. While meeting the needs of personal growth, it can also show the commodity attributes of labor, it is market-oriented and cultivates professionals to meet market needs. Vocational education also has a certain degree of productivity, and it can be combined with enterprises for corresponding production while conducting practical teaching. It can be seen that in the process of economic development, the development path of deepening vocational education reform must be taken.

Secondly, the ultimate goal of coordinated development between vocational

education and the economy is win-win cooperation. Local governments, vocational education institutions, enterprises, industries and other entities are the main entities involved in the coordinated development of vocational education and the economy. The development issues of these entities are actually the problems of coordinated development, complementary advantages, mutual promotion, and win-win cooperation among the government, schools, enterprises, and banks.(Zhang., 2018) Against the backdrop of the current deepening period of reform and opening up, comprehensive supply side structural reform should be carried out. The development of vocational education should be based on industrial development and job demands of industry enterprises. In terms of institutional mechanisms, school enterprise cooperation, teacher team construction, industry education integration, and other aspects, efforts should be made to develop a multi subject collaborative and win-win development strategy, continuously improving the level of industry education integration and talent quality, Ensure that the supply capacity and quality provided by vocational education can be significantly improved, and that the ability of vocational education to serve economic and social development can be significantly enhanced, ultimately achieving win-win cooperation.

The economic effects of vocational education in China have certain selection characteristics. Firstly, the collaborative choice between vocational education and economic development has the characteristic of diverse choices. Vocational education can provide the talents, technologies, and corresponding services it cultivates to corresponding enterprises, while enterprises can provide their capital, products, concepts, etc. to vocational education, forming a mutually promoting relationship. The actual relationship between vocational education and economic development is a multi-directional choice. In addition, with the support of this relationship, vocational education provides its talents, technology, and corresponding services to economic development, forming diversified supporting factors, which in turn increases the number of multiple choices between vocational education and economic development at another level.

Secondly, the collaborative choice between vocational education and economic development has the characteristic of self adjustment. The experience of developed

countries such as the United States, Japan, and the United Kingdom in the coordinated development of vocational education and economy shows that vocational education and economic development are a form of self adjustment. In the process of coordinated development of vocational education and economy, the government also plays an important role, mainly formulating rules to regulate their behavior. Enterprises are the core subjects of vocational education, and they ultimately form reasonable performance through long-term self adjustment Rules for the allocation of risks and benefits. Finally, the collaborative selection between vocational education and economic development exhibits a characteristic of random selection. In the process of mutual selection between a large number of vocational education institutions and enterprises, the forms of transactions between both parties are formal and informal, and the contents of transactions are tangible and intangible. The diversity of transaction forms and contents between them makes the selection process of both parties random.

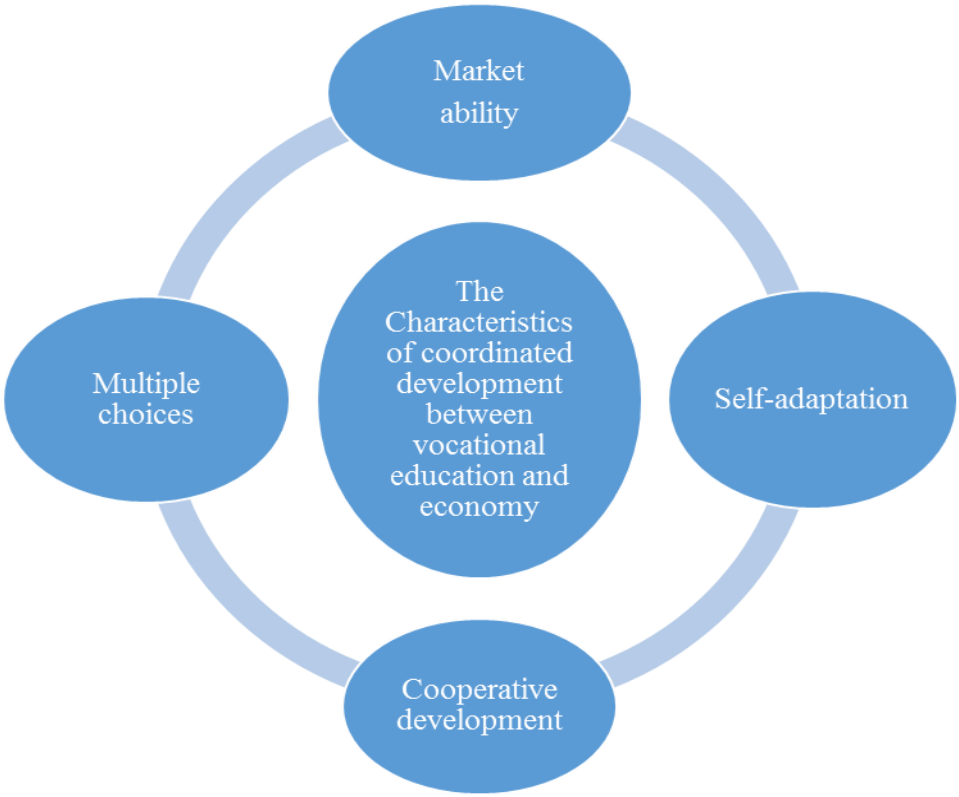

Figure 3.7 - The characteristics of coordinated development between vocational education and economy

Source: Prepared by the author

In summary, the coordinated development of vocational education and the economy is market-oriented, characterized by cooperative development, diverse choices, and self-adaptation. As shown in Figure 3.7.

The economic effects of vocational education in China are mainly manifested in the following aspects. Ensure the effective implementation of economic development strategies. Due to significant differences in economic, political, cultural, and social realities in different regions, there are also significant differences in the development of vocational education. The accumulation of human capital varies greatly, resulting in inconsistent economic development strategy choices. For regions with low levels of education development, low labor quality, and insufficient human capital stock for a long time, labor-intensive industries based on resource endowment can be prioritized as the leading industry to promote economic development. For regions with good education development, high labor quality, and sufficient human capital stock for a long time, in order to promote economic development, By establishing a complete system and implementing good financial support, high-tech industries can be chosen as the leading industry in the region. Therefore, a region should choose corresponding development strategies based on its actual situation, and choose multi-level strategies that are in line with economic development based on the local level of vocational education development and human resource distribution. According to the regional economic development status, the development of vocational education plays an important role in improving employment levels, increasing the stock of human capital, and promoting economic development. Various regions can attract a large number of young students of appropriate age into vocational education. During the training and education process, these young students' theoretical knowledge is constantly enriched, and their skills and abilities are also continuously improved. While achieving educational effects, they can also achieve investment in human capital and ultimately cultivate skilled talents suitable for economic development. Therefore, the scale, quality, and characteristics of the development of vocational education have an important impact on the implementation of economic development strategies.

Promote the continuous improvement of the soft environment for economic development. The speed and quality of economic development are largely constrained by the soft environment of economic development. Relevant studies have shown that the speed and level of economic development can positively affect the dependence on the soft environment, that is, the faster and higher the economic development speed and level, the stronger the dependence on the soft environment.(Yang., 2010) The soft environment of economic development mainly refers to the necessary humanistic and moral environment in the process of economic development, including folk customs, honesty and trustworthiness, love and dedication, and civilized and polite manners. Under the conditions of a market economy, regions with better investment environments are more favored by investors. In the current situation where the hardware environment in various regions has been generally improved and competition is becoming increasingly fierce, it is necessary to continuously improve the software environment for economic development in order to form a comparative advantage. In the process of constructing a soft environment, people play a central role, and the improvement of the soft environment is largely influenced by people's ideological concepts. Education plays a crucial role in the change of people's ideological concepts. The development of vocational education plays an important role in creating a good soft environment. It can shape people's outlook on life, worldview, and values to meet the needs of economic development, constantly transform outdated ideas, customs, and production and lifestyle, form a thinking mode and modern civilization that adapts to the times and economic development, continuously promote institutional innovation, and form a good social atmosphere, To achieve economic development. The "Modern Vocational Education System Construction Plan (2014-2020)" jointly issued by six departments including the Ministry of Education, the Ministry of Human Resources and Social Security, and the Ministry of Agriculture of China clearly states that the students trained in vocational education are the inheritors of Chinese ethnic crafts and culture. Vocational education should fully include products, crafts and culture with national characteristics. The whole process of vocational education should fully reflect national culture, cultivate folk artists, skilled

masters and inheritors of Intangible cultural heritage, constantly promote the construction of soft environment and promote economic development.

Accelerate the optimization and upgrading of industrial structure. The upgrading of industrial structure is a process of gradual transformation from low-level to high-level. It is an important part of the transformation of economic growth mode, including the transfer and upgrading of the Primary sector of the economy to the Secondary sector of the economy, and then to the Tertiary sector of the economy, as well as the transfer and upgrading of labor-intensive industries to technology intensive industries. The adjustment of economic structure is an important internal driving force for economic development, including gradually promoting the transformation and upgrading of traditional industries, and achieving the development of characteristic industrial economies. With the gradual transformation of the Chinese economy towards high-quality development, the important factor that restricts the high-quality development of the Chinese economy has been reflected in the shortage of innovative and applied talents. The practical and technical talents trained in vocational education can effectively promote rapid economic development. Vocational education can be seen to some extent as an important form of human investment. The high-quality applied technical talents cultivated by vocational education ensure a continuous increase in the supply of composite, skilled, and innovative talents, which directly affects the upgrading of industrial structure. With the gradual deepening of the reform of vocational education mechanism and system, China's vocational education has closely integrated talent cultivation with industry demand and economic development. The direction and structure of education are constantly being adjusted, and the curriculum system, teaching content, and talent cultivation mode of vocational education are also constantly being reformed. Students' professional quality and practical ability are constantly improving, and their service ability for economic construction is continuously enhanced. The talents cultivated by vocational education are skilled talents who play a crucial role in the production process. Figure 3.8 shows the relationship between the scale of vocational education in China and the coordinated growth of national GDP, once again proving that the development of vocational

education can provide sufficient human resources for economic development, continuously promote the transformation and upgrading of industrial structure, and achieve the transformation of economic growth mode (He et al., 2016).

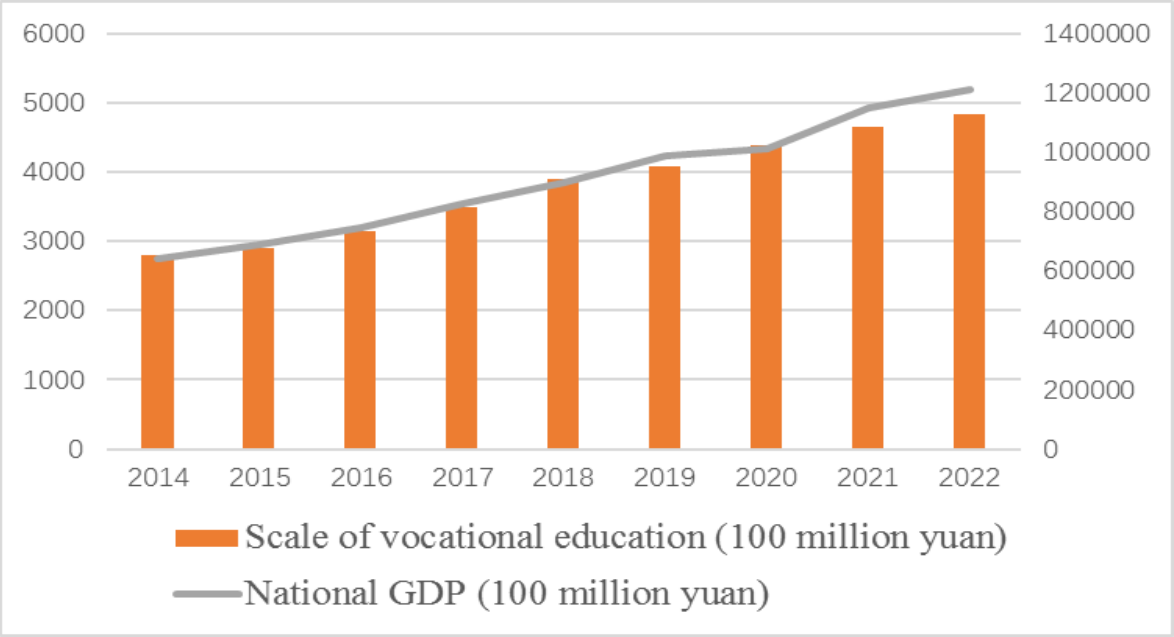

Figure 3.8 - The relationship between the scale of vocational education in China and the coordinated growth of national GDP

Source: National Bureau of Statistics

Achieve rapid transformation driven by innovation. The stage of China's economy driven by factors has come to an end and is undergoing a new stage of development from efficiency driven to innovation driven. "Adhering to innovative development" was clearly proposed at the Fifth Plenary Session of the 18th Central Committee of the CPC, and innovative development has entered the strategic level. The primary driving force for sustainable economic development lies in innovation, which is the key to economic development, and the various talents provided by vocational education are the top priority for improving innovation capabilities. From Schumpeter's Innovation Theory to Schultz's theory of human capital,(Schultz., 1961) The ultimate goal lies in education. The implementation of the innovation driven development strategy requires not only a large number of talents such as engineers, scientists, and entrepreneurs, but

also a large number of highly skilled talents and high-quality workers. The high-end and top-notch talents needed to meet innovation can be achieved through training and introduction, but thousands of technical and skilled talents and high-quality workers cannot be satisfied through introduction. Only through vocational education can they be continuously satisfied. The role of vocational education in innovation is not only reflected in the accumulation of human capital and direct participation in research and development, but also in the differentiated talents cultivated by vocational education, as well as the promotion of innovation and the manufacturing of innovative achievements by these talents. At present, there is a shortage of skilled talents suitable for economic development in China, and the low quality of workers is also an important factor restricting innovation. This makes it difficult for a large number of innovative achievements to be converted into productivity in a timely manner, preventing the transformation and diffusion of advanced technology. Therefore, vocational education should accelerate its development, effectively achieve innovation driven, comprehensively improve the quality of a wide range of workers, and promote coordinated economic development.

Promote the improvement of poverty alleviation and assistance effects. The 19th National Congress of the CPC on vocational education clearly stated: "We should not only improve the vocational education and training system, continue to deepen the integration of industry and education and school enterprise cooperation, but also do a good job in continuing education, improve the speed of building a learning society, and vigorously improve the national quality."(Shi et al., 2019) These formulations are completely consistent with the contradiction between the growing needs of the people for a better life and the imbalanced and insufficient development, indicating the direction of vocational education development. The Fifth Plenary Session of the 18th Central Committee of the CPC put forward the basic requirements for building a moderately prosperous society in an all-round way. By 2020, under the current standards, the rural poor population should truly shake off poverty, all poor counties should be decapitated, and the overall regional poverty problem should be solved. Of course, China has now fully achieved a complete victory in the poverty alleviation

campaign. In this process, by carefully studying the root causes of poverty, fully valuing the role of vocational education, and guided by the poverty alleviation development concept of "supporting intelligence before poverty alleviation, and strengthening education before intelligence", the combination of supporting intelligence and supporting will will will be combined. While blood transfusion, more attention will be paid to hematopoietic function to ensure that the hematopoietic capacity of the impoverished population in poverty-stricken areas continues to improve, and to ensure that the people of the whole country can smoothly enter a moderately prosperous society. A key focus of the Party Central Committee's poverty alleviation and development work is to implement education poverty alleviation, and practice has proven that vocational education plays an important role in poverty alleviation. Vocational education can effectively solve the biggest livelihood problem of employment, and continuously improve the ability of workers to lift themselves out of poverty and become rich. At the same time, high-quality frontline technical and skilled talents in production and management are provided to poverty-stricken areas, promoting their economic development, to achieve cultural prosperity and prosperity. Vocational education can also ensure that students from impoverished families in poverty-stricken areas can enjoy the right to education, reduce dropouts and dropouts due to poverty, acquire cultural knowledge and skills through education, drive impoverished families out of poverty, block intergenerational transmission of poverty, and enable impoverished areas and families to fundamentally overcome poverty and truly achieve a moderately prosperous society.

The essence of vocational education is to cultivate more practical and skilled talents who can adapt to economic development for society, and then coordinate with economic development. All activities of vocational education should be closely focused on this goal. However, if the talent cultivation in vocational education cannot meet the job requirements, it will have a certain lag effect on economic growth to a certain extent. Therefore, in order to coordinate the development of vocational education and the economy, identifying and solving the problems that vocational

education affects the economic effect is an important measure to promote economic development.

The degree of homogenization in talent cultivation is relatively high. Chinese vocational education is mainly based on individual sustainable development and the needs of social occupational job groups. It vigorously cultivates frontline employees, undertakes production, management, and service tasks, and can directly create value for society with advanced applied and skilled talents.(Yang., 2014) However, in practical development, although China's vocational education has experienced rapid development for over 30 years, it seems to have entered a "bottleneck period". Overall, the lack of distinctive characteristics in education, the proliferation of popular disciplines, and the poor adaptability of disciplines required to adapt to economic development make it difficult for talent training work to meet the needs of economic and social development, which has greatly affected the development of the economy and society. From the current situation, most vocational education institutions usually rush to open so-called "popular majors" in order to attract students to register, ignoring the actual needs of society, in order to expand the scale of education. This blind expansion of enrollment greatly affects the quality of student training, resulting in duplicate major settings and a high degree of "homogenization" in education The phenomenon of high Structural unemployment rate caused by excessive market supply is widespread. The specialty setting of vocational education is difficult to meet the needs of economic development and lacks the characteristics of running a school. According to relevant data, in 2022, there were a total of 765 vocational colleges approved and registered by the Ministry of Education, with 59111 professional points. Out of nearly 60000 professional distribution points, there were over 3200 computer related distribution points and over 2300 accounting related distribution points. It can be seen that the repetition rate of professional settings in Chinese vocational education is high, with severe homogenization and a lack of professional characteristics, which greatly reduces the effectiveness of vocational education talent cultivation. While the adaptability to rapid economic development is not high, it is also not conducive to the sustainable development of vocational education.

Poor balance in the development of vocational education. Economic support is a prerequisite for expanding the scale of education, and the scale and speed of vocational education development are largely influenced by economic strength.(Xu et al., 2014) At present, there is a significant imbalance in China's economic development. The eastern region is relatively developed, while the western region is relatively backward. The economic gap between the eastern and western regions is very obvious. The Primary sector of the economy plays a leading role in the economic and industrial structure of the western region. The regional industrial structure is characterized by "one oil is the largest", "one mine is the largest", and "one coal is the largest". The degree of processing is relatively low, and the requirements for skilled professionals are low. The integration of industry and education in vocational education in underdeveloped areas in western China is relatively low, and the outflow of talents is relatively serious. Most of the professional and technical Human capital flight cultivated in this region have been drained out to find jobs in relatively developed areas, which makes it difficult to realize the situation of "industry development forces vocational education" in developed areas. At the same time, due to the relatively backward economic development level in the western region, a long-term and stable investment mechanism has not been established in the development of vocational education, and the conditions for running schools are relatively poor. The phenomenon of a lack of professional teacher resources, school buildings, and internship and training equipment is widespread in the western region. The economic development in the eastern coastal region is relatively good, and the demand for high-level technical and skilled talents is high, which makes the development of vocational education in the region larger, faster, and of better quality. Compared to the western region, the eastern region has better educational conditions, stronger teaching staff, and more balanced student development in terms of vocational education development. This makes the technical and skilled talents cultivated by vocational education in the eastern region have higher quality, which can provide sufficient human resources for economic development, improve the speed and quality of economic development, and promote the healthy, rapid, and healthy development of vocational education，this

phenomenon objectively exacerbates the gap in vocational education between the eastern and western regions.

The cooperation mechanism between schools and enterprises is still incomplete. Chinese vocational education is mainly based on the public system, which inevitably determines that the government's financial investment is the main resource input for public vocational education institutions. Public vocational education institutions are the users and beneficiaries of resources, while the government is the investor and manager of resources. Due to the long-term impact of this system, many vocational education institutions blindly rely on the government and carry out extensive infrastructure construction, with insufficient emphasis on connotation and quality construction, and neglecting the technological progress and industry development needs of enterprises. Economic development is largely influenced by the development of modern enterprises, and economic development can effectively promote the development of vocational education. School enterprise cooperation has become the main mode of promoting the coordinated development of vocational education and the economy, which can effectively achieve organic integration between them. However, in the process of promoting school enterprise cooperation in vocational education and the economy, the progress of school enterprise cooperation is relatively slow, and problems such as incomplete cooperation mechanisms and insufficient supporting measures are more obvious. Specifically, there is a lack of unified planning and layout of school enterprise cooperation at the government level, insufficient financial support and policy inclination, and a lack of unified overall action.(Sun., 2016) Secondly, both schools and enterprises do not have standardized responsibilities and obligations, and when conflicts of interest arise, responsibilities and obligations are unclear. Finally, some vocational education institutions' students' practical courses do not match their majors, making it difficult to meet the needs of enterprises for professional and skilled talents.

The talent training overpass has not been established yet. Vocational education is mainly oriented towards employment in talent cultivation, and the basic principle of learning basic theoretical knowledge is sufficiency. In the process of training, more

emphasis is placed on students' practical and operational abilities. Compared with graduates from research-oriented universities, graduates from vocational education institutions have stronger practical skills and relatively higher technical levels, while research-oriented graduates have more basic theoretical knowledge, a wider range of knowledge, and higher cultural literacy. The education model and talent cultivation methods of vocational education institutions place excessive emphasis on the cultivation of students' practical abilities, but the learning of basic theoretical knowledge is insufficient, making it difficult for these students to upgrade to higher level schools for learning. In addition, when students from vocational education institutions enter higher-level vocational education institutions, there are also very serious docking problems. At present, the boundaries between vocational education institutions and applied universities in China are blurred and there is no clear division of labor, making it difficult for graduates of vocational education institutions to effectively connect with higher-level vocational education institutions, resulting in serious waste of educational resources.

Method innovation to strengthen Chinese vocational education supervision and promote the sustainable development strategy of the national economy. Under the New normal economy, vocational education with dual attributes of economy and education has become an important bridge to promote economic development, and the educational reform of the times will inevitably require the balanced development of vocational education itself. Based on this, how to take effective measures to promote the coordinated development of vocational education in the economy and achieve balanced development of vocational education in an environment of coordinated economic development is an important research content in this section. Due to the high coupling and interdependence between vocational education and regional economic interactive development, starting from clarifying the main participants and functions of vocational education, and under the guidance of determining the guiding principles of vocational education and economic interactive development, relevant strategies are adopted to achieve a benign interactive development between vocational education and the economy.

Participants and Functional Positioning of Chinese Vocational Education. As the major decision to comprehensively deepen economic reform is implemented nationwide, deepening vocational education reform is an important part of it. After summarizing and analyzing the current situation of vocational education development, it is found that the essence of vocational education governance is the joint consultation and management of specific affairs in the development of vocational education by various entities, including the government, industry organizations, enterprises, and vocational education institutions, in order to continuously promote the development of vocational education and achieve benign interactive development with the economy (Zhou., 2017).

Government entities and their functions. Although there will inevitably be "Government failure" in the development of vocational education, this cannot totally deny the role of the government in the development of vocational education. In fact, the government plays an indispensable role in the process of vocational education. The government is the only important entity that can take responsibility for governance issues in the development of vocational education. The government is not dispensable at all stages of vocational education development, and the coordination of multiple governance entities and centers cannot be effectively achieved without the government (Wang., 2009). It can be seen that the leading role of the government in vocational education is irreplaceable.

Based on the idea of joint governance among multiple subjects in the development of vocational education, it is necessary to ensure that the government, industry organizations, enterprises, and vocational education institutions are in their respective positions on the basis of equal status, and continuously form role positioning that can ensure their respective "central" positions, effectively promoting the development of vocational education. The role of the government in the development of vocational education should gradually shift from government leadership to government guidance, achieving a shift from the "government controlled model" to the "government guided model", "government supervision model", and "government support model" in the development of vocational education (Wu., 2013).

Industry organization entities and their functions. Public welfare, industry, production, and commonality are the attributes of vocational education,(Liu et al., 2004) these attributes leads to various management contradictions in its development. If there is an excessive reliance on non productive education authorities, it is likely that vocational education management will become ineffective due to information asymmetry. At the same time, if there is excessive reliance on industry regulatory authorities, it is likely that the individual and temporary nature of market information will lead to problems such as fragmentation, inefficient talent cultivation, and resource waste in the development of vocational education. In the process of the development of vocational education in China, there has been a shift from being centered around industry regulatory departments to being centered around education regulatory departments. However, the practical results are not ideal, and the problem of disconnection between vocational education and the economy cannot be solved. Therefore, the key to the reform and in-depth development of the management system in the development of vocational education in China lies in finding a platform that combines the interests of both education and industry, between the education administrative and industry authorities (Liu., 2019).

Based on the above analysis, industry organizations are a very ideal choice. Industry organizations have the characteristics of folk, public welfare, and autonomy. They are composed of resources from the same industry and other economic organizations, and are social organizations that provide services and self-discipline management to member units. Industry organizations play an important role in the development of vocational education. Whether viewed from specific historical periods and the needs of educational reform, or from theoretical research and institutional practice, it is very important to establish industry guidance, industry evaluation, and services for vocational education.

To create industry guidance, evaluation, and service functions that determine the industry organization in the development of vocational education from a top-level design perspective. The full utilization of these functions is beneficial for industry organizations to effectively achieve materialized capital output, accumulate technical

knowledge, share information resources, and enhance personalized value (Gao et al., 2016). In terms of accumulating technical knowledge, effective measures should be taken to formulate reasonable multi-party participation and support policies, promote effective interaction between the government, enterprises, vocational education institutions, and industry organizations, and achieve the accumulation and innovation of technical skills. From a practical perspective, in the development of vocational education, the main source of the accumulation of technical skills is the effective interaction and collaboration between vocational education institutions and industry enterprises; In terms of enhancing the value of humanization, industry organizations should obey the value-added logic of human resources in the development of vocational education. Vocational education is the first training base, birthplace, and integration place for industry talents, and bears arduous tasks in promoting national and local strategic development. If industry organizations fully play their role, they can promote the smooth completion of these tasks.

Enterprise entities and their functions. The attributes, characteristics, and operational mechanisms of vocational education itself determine that enterprises should become important entities in the development of vocational education. From a philosophical perspective, the subject has a certain level of understanding and practical ability towards the object, and can determine the significance of its existence; From the perspective of stakeholders, the main beneficiaries are the direct stakeholders; From a legal perspective, the subject is the recipient of rights and obligations (Shao., 2017). Various participants in the development of vocational education can become the main body of vocational education development, which can determine the direction of vocational education development, benefit from vocational education services, and affect the effectiveness of vocational education. Enterprises play an important role and are an important subject in the development of vocational education. Enterprises are the purpose and destination of vocational education development,(Luo et al., 2019) enterprises are not only direct stakeholders and beneficiaries in the development of vocational education, but also important decision-makers in the development of vocational education. Their dominant position in the development of vocational

education cannot be ignored.

In vocational education, whether it is the independent establishment of vocational education institutions, participating in school enterprise cooperation, or participating in the entire process of vocational education talent cultivation, the ultimate goal of enterprises is to continuously improve their level of technical and skilled talent cultivation, thereby improving the competitiveness of enterprises based on human capital and enabling enterprises to obtain more profits(Gao., 2019). As an important entity in the development of vocational education, enterprises can participate in talent cultivation, achieve integration of industry and education, and increase education investment, which is also very helpful for improving the governance level of vocational education. It can be said that the participation of enterprises in the governance of vocational education is of great significance for the modernization of vocational education governance capabilities and the improvement of vocational education levels.

The Main Body and Functions of Vocational Education Institutions. The important practical place for the development of vocational education is vocational education institutions, and of course, vocational education institutions should become an important subject in the development of vocational education. Except for private vocational education institutions, other levels and types of vocational education institutions are actually extensions of national institutions and the ultimate agency for the development of vocational education. At present, it is necessary to fully unleash the enthusiasm and creativity of vocational education institutions in running schools, strive to establish efficient vocational education institutions, effectively cultivate high-quality technical and skilled talents, ensure the improvement of quality while ensuring the quantity of talents, and provide sufficient human resources for economic development.

Vocational education institutions, as important entities in the development of vocational education, play an important role in the development of vocational education. On the one hand, vocational education institutions can provide high-quality technical and skilled talents. The frontline talents of enterprises are mainly provided by vocational education (Xia et al., 2015). simultaneously vocational education is an

education that combines skills, professionalism, and application. Students acquire basic knowledge and theories related to technical skills in the classroom, and their problem-solving and technological innovation abilities are continuously improved through the training of vocational education institutions. These all lay the foundation for students to effectively carry out production internship teaching. Vocational education institutions should establish a mechanism for cooperation with enterprises, enhance their enthusiasm for cooperation, and continuously expand the breadth and depth of cooperation to serve enterprises and the economy. On the other hand, vocational education institutions are the main force in promoting cooperation. Vocational education institutions play a bridge and link role between the government, enterprises, and vocational education institutions, and are an important force in promoting mutual cooperation. Continuously strengthening communication between the government, industry organizations, and enterprises through vocational education institutions, improving and promoting the implementation of external coordination mechanisms, while promoting effective cooperation among various subjects of vocational education, achieving interactive development between vocational education and the economy. The guiding principles for the interactive development of vocational education and economy in China are shown in Figure 3.9.

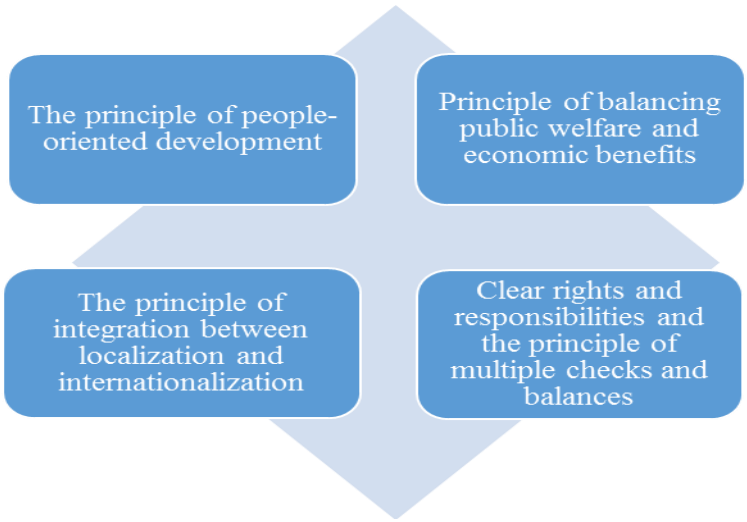

Figure 3.9 - Guiding Principles for the Interactive Development of Vocational Education and Economy in China

Source: Prepared by the author

The principle of people-oriented development. Putting people first is the essence and core of the scientific development concept, which requires the full development of human subjectivity and is also a principle that must be followed in the development of vocational education. The principle of putting people first requires that in the development of vocational education, attention should be paid not only to the skill training of learners, but also to the cultivation of their comprehensive abilities. The ultimate goal of the development of vocational education is to achieve comprehensive progress in society and the comprehensive and free development of people. To achieve human freedom and comprehensive development, it is necessary to provide an equal external environment for everyone in society to grow and develop. The development of vocational education is an important element and path for human and social development. Human development rights, directions, opportunities, social status, and economic interests are all influenced and constrained by their level of development. The level of vocational education development will inevitably affect human development. Therefore, from the perspective of human development, in order to improve the level of vocational education development, conducting comprehensive reforms on vocational education plays a very important role in liberating human nature and promoting changes in the fate of workers. At the same time, it can also continuously meet people's development needs and the development of vocational education itself. The smooth development of vocational education follows the principle of putting people first. Firstly, it is necessary to establish a spatial environment that is conducive to everyone's development. The convenience of people receiving vocational education and training must be considered as an important factor in the overall coordination of vocational education, ensuring that those who want to receive vocational education can receive corresponding vocational education and training anytime and anywhere; Secondly, it can provide people with a rich teaching environment that is conducive to their development. On the one hand, rich and diverse teaching content can meet the needs of different groups of people for vocational education; On the other hand, it can also meet the needs of community personnel to receive lifelong education and enjoy different types of education. Finally, it is possible

to provide people with affordable and high-quality vocational education and training. This mainly satisfies the needs of those who find it difficult to afford higher tuition fees and are willing to receive vocational education and training.

Principle of balancing public welfare and economic benefits. "Facing everyone" is the essential attribute and important principle of the development of vocational education in China, that is, the public welfare of education. Public welfare is also reflected in fairness, while practical education fairness is a concentrated manifestation of its values and bears the social responsibility of providing vocational skills training to more people in need. At the same time, the public welfare of vocational education plays an important role in improving people's income, promoting employment, improving people's lives, and promoting economic development.(Zhou et al., 2019) However, the policy orientation of prioritizing efficiency in economic development has long influenced the public welfare of vocational education. This policy orientation has been infinitely amplified to a certain extent, inevitably leading to a gradual increase in the gap in the quality and coverage of public services, including vocational education, enjoyed by urban and rural members of society. Its negative impact on the development of vocational education in underdeveloped areas is far less than its impact on economic development. In addition, under the influence of China's economic system and traditional culture, the development of vocational education in China appears relatively conservative and closed compared to European and American countries, and the market openness of vocational education is much lower than that of European and American countries. In fact, developing a market economy is the correct choice for China's socialist modernization construction (Luo., 2004). Under the conditions of a market economy, the public welfare demonstrated by the development of vocational education has its rationality and will not conflict with the market economy. In the view of economics, the industrial attributes and economic characteristics of education coexist, with both productiveness and efficiency. At the same time, it has its particularity, that is, talent cultivation cannot be equated with economic production; From a sociological perspective, education is service. The essence of the development of vocational education is to effectively utilize market

mechanisms under the premise of educational public welfare, in order to better play the role of vocational education in economic services. Therefore, the organic combination of vocational education and market economy is highly valued, which can effectively improve the efficiency of vocational education in serving economic reform and development, and can continuously break through the barriers to the combination of economy and public welfare, which is conducive to the basic requirements of forming a new mechanism and model of positive interaction.

The principle of integration between localization and internationalization. The economic conditions, customs, and cultural conditions of different countries and regions are different, and the level of vocational education also varies. Therefore, it is not possible to adopt the same measures and policies for the development of vocational education in different regions. This requires that the relevant governance of vocational education development should be tailored to local conditions. In today's world, economic integration is unstoppable, and the development of vocational education in China is bound to be affected by it. Vocational education cannot develop independently and in a self closed manner, and it will achieve development in an open system. In the process of developing vocational education in China, the governance of vocational education should closely revolve around the development characteristics and current situation of vocational education in China, and take governance actions and measures suitable for the development of vocational education in China based on the principles of internationalization and localization, targeting the economic, social, political, and cultural characteristics of different regions in China, to ensure the smooth development of vocational education in China (Qi et al., 2014). In the process of the integration and development of internationalization and localization, we should unswervingly adopt the views, positions and methods of Historical materialism and dialectical protectionism, conduct specific analysis and in-depth research on various problems that may be encountered in the development of vocational education, recognize the reality on the basis of referring to the development history of vocational education, keep pace with the times, and constantly bring forth the new. Based on China's basic national conditions and taking into account the characteristics of China's

vocational education development, effective measures should be taken to actively promote the localization research of China's vocational education, and continuously form a vocational education governance theory that adapts to China's national conditions. At the same time, we should also adopt the "going out" perspective, constantly absorb and learn from the successful experience of the development of vocational education in developed countries and regions, take its essence and discard its dross, ensure the organic integration of historicity and timeliness, internationalization and localization, and constantly carry out integration and innovation under such conditions to build a theoretical and technical platform for the development of vocational education with Chinese characteristics.

Clear rights and responsibilities and the principle of multiple checks and balances. In the process of vocational education development, it is necessary to have clear responsibilities. Unclear responsibilities can easily lead to situations such as offside, dislocation, and vacancy of power. Clear responsibilities can be said to be the basic requirement for the development of vocational education. The development of vocational education also requires the government to smoothly achieve functional transformation, gradually transitioning from an "all-round" government to a "service-oriented" government (Wang et al., 2015). the transformation from "omnipotence" to "Finitism" should also be smoothly realized within the scope of functions (Liao., 2015). The development of vocational education needs to handle both horizontal and vertical powers at the same time. Among them, horizontal power places a high emphasis on subjectivity, specifically referring to the distribution of power in vocational education among government, industry organizations, enterprises, and vocational education institutions. This horizontal power distribution is based on the premise that each subject clarifies its own power nature, object of action, and scope of action, To avoid the abuse and dislocation of vocational education power among different subjects; Compared to the emphasis on subjectivity in horizontal power, vocational education should clearly define the power boundaries and scope of responsibilities of various levels of departments in vertical power, to prevent the occurrence of confusion in responsibilities. The principle of clear responsibilities

requires the government to pay more attention to the function of macro regulation in the distribution of power, and other entities such as vocational education institutions, industry organizations, and enterprises should better fulfill their micro regulation and supervision evaluation responsibilities in the development of vocational education. On the basis of clear responsibilities, maximizing the effectiveness of vocational education power inevitably requires the formation of a diversified balance mechanism of power, which is an inevitable choice to achieve the development of vocational education. To achieve the optimal allocation of vocational education power among the government, industry organizations, enterprises, and vocational education institutions, it is necessary to establish an effective mechanism for the operation of vocational education power that is interdependent and mutually restrictive. This can avoid excessive power expansion leading to power imbalance and ineffective vocational education governance, thereby hindering the development of vocational education.

Strategies for the Interactive development of Chinese vocational education and economy. Improve the level of collaborative governance among multiple entities. The development of vocational education involves multiple subjects, and there are certain differences in the interests and demands of each subject. An effective co governance mechanism should be established to continuously improve the level of collaborative co governance among multiple subjects. The collaborative governance of multiple subjects should comprehensively consider the interests of multiple subjects and effectively gather them together to construct a multi-dimensional framework for the development of vocational education, including government, industry organizations, enterprises, and vocational education institutions (Zhang et al., 2015). Gradually forming a vocational education development model guided by the government, guided by the industry, with the participation of enterprise entities, and independently implemented by vocational education institutions. By forming a consensus on the value of multiple subjects, strengthening collaborative innovation among multiple subjects, improving the evaluation mechanism for multiple subjects, and constructing a mechanism for accountability among multiple subjects, we can continuously improve the level of collaborative governance among multiple subjects.

Adhere to government guidance on vocational education governance. Vocational education can be said to be a "public good" or "public service" to some extent. In the process of its development, the government's guiding role is becoming increasingly apparent. The government is the macro regulator of the development of vocational education, and its governance system for vocational education lays the foundation for its development. Moreover, the government's governance ability and methods for vocational education determine the direction of its development, The government should fully assume its responsibilities in the process of functional transformation, reasonably streamline administration and delegate power, manage in services, serve in management, adhere to the guidance of the government, fully coordinate the relationship between the government, industry organizations, enterprises, and vocational education institutions, ensure that the governance capacity of vocational education can be continuously improved, and promote the sustainable development of vocational education in China. Adhere to the governance of vocational education guided by the government, further strengthen the rule of law governance of vocational education, constantly improve the service level of the government, increase the financial support of the government for vocational education, and further strengthen the ability of vocational education to produce human resources for economic construction.

Enhancing the effectiveness of industry organization guidance. An important weakness in the development of vocational education in China is that the function of industry organizations in guiding vocational education is difficult to effectively play. In the process of guiding vocational education, industry organizations not only have deficiencies in guidance capabilities, platforms and mechanisms, but also outdated guidance methods, which will affect the effectiveness of industry organization guidance. Even under the mobilization of a high degree of consensus and broad policies, in order to enhance the effectiveness of industry organization guidance in the development of vocational education, it is necessary to strengthen administrative coordination, improve institutional mechanisms, enhance the professional level of industry organization guidance, evaluation, and services, and support them with

systematic policies. To enhance the effectiveness of industry organization guidance, it is necessary to further clarify specific responsibilities, establish a scientific industry organization leadership mechanism, attach importance to the improvement of industry organization service capabilities, and make the development direction of vocational education more effective in meeting industry needs.

Promoting the full play of the role of enterprise entities. An important subject in the development of vocational education is enterprises, which is not only a need for their own development, but also an inevitable choice to build a modern vocational education system and promote the development of vocational education. Vocational education has made significant progress in recent years, and the multi subject co governance system that has been formed, including government guidance, industry guidance, enterprise participation, and the implementation of vocational education institutions, has been widely recognized by society. Enterprise participation can effectively promote the development of vocational education. With the development of the economy and the widespread attention of various sectors of society, the system and mechanism of enterprise participation in the development of vocational education are constantly improving. At the same time, the educational and talent training models of enterprise participation are also constantly innovating and improving.

Although enterprise participation in the development of vocational education has an important positive role, it cannot be denied that there are problems in enterprise participation in the development of vocational education, The issues related to institutional mechanisms, educational channels, and determination of rights and responsibilities have not yet been fully resolved. To promote the full play of the role of enterprise as the main body, it is necessary to further clarify the rights and responsibilities of enterprise society, encourage enterprises to explore diversified education, establish a long-term mechanism for enterprises to participate in vocational education, and clarify the property rights boundary of vocational education school enterprise cooperation in order to truly play the role of enterprise as the main body of vocational education.

Strengthening the implementation of autonomous execution in vocational education institutions. Only by taking vocational education institutions as the core of action and continuously improving their autonomous execution ability can we effectively improve the level of educational governance and achieve better governance results, ultimately benefiting the development of vocational education (Li et al., 2014). At the same time, it is pointed out that vocational education institutions must be taken as the basic foothold in order to establish a sound education governance system and enhance the modernization level of education governance capabilities(Yuan., 2014). Therefore, the dominant position of vocational education institutions in the modern vocational education governance system should be valued and continuously strengthened, enhancing the initiative of vocational education institutions, strengthening their execution power, and effectively promoting the development of vocational education. To strengthen the autonomous execution of vocational education institutions, it is necessary to further expand the autonomy of vocational education institutions in running schools, continuously strengthen the construction of new teacher teams, establish professional structures suitable for economic development, and construct a scientific and effective teaching evaluation system to ensure that the teaching quality of vocational education institutions meets the social and economic needs for technical and skilled talents.

3.3. Improvement of the innovative control system of Chinese professional education within the framework of the strategy of sustainable development of the national economy

In the process of constructing information technology for personnel management in vocational education institutions, the first step is to select the technologies needed based on the functions to be implemented by the system, in order to meet the requirements of personnel management information technology.

Java EE technology. Java EE refers to the Java Enterprise Edition, which is commonly used for enterprise level development, including web development, and so on. The enterprise version helps develop and deploy portable, robust, scalable, and secure server-side Java applications. JavaEE is built on the basis of JavaSE, providing web services, component models, management, and communication API, that can be used to implement enterprise level service oriented architectures (SOA) and Web 2.0 applications. With the continuous updates and upgrades of technology, Java EE has attempted different designs for logical layering and divided components into different levels, more commonly applied to multi-layer distribution patterns, where components can be assigned according to their performance. At present, Java EE has four layers: web functionality for accessing interfaces, deployed on the Java EE architecture, where the access method of CICSECI through the CICS transaction gateway is implemented. As shown in Figure 3.10.

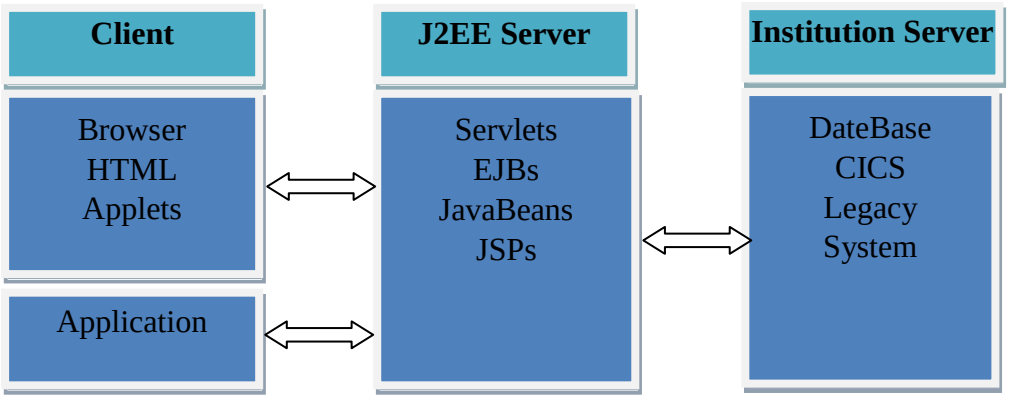

Figure 3.10- JavaEE hierarchy.

Source: Prepared by the author

In B/S mode system operation, implementing client layer instructions through a browser eliminates the need for additional supporting programs to be installed on the client, which is obviously very convenient. The network layer components of Java EE are reflected through the internal page layer of the program, and the dynamic and static page mode is used to achieve feedback on the results of business layer processing. The main purpose of business layer components is to solve business logic problems within the application program. After receiving requests and instructions from users, the user layer analyzes them as recognized programs by the component. The business layer

classifies and processes them through internal partitions, and the processing results will be directly fed back to the user after the calculation is completed. The core of the information system layer is generally composed of databases, resource management systems, and other systems. Its main function is to provide basic data information for the normal operation of the system and ensure the accuracy and speed of data sources, which is the foundation for achieving normal system operation.

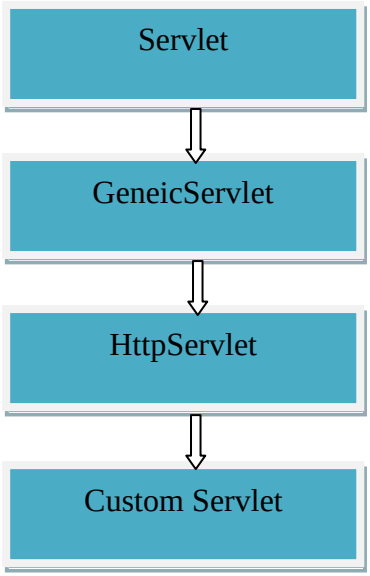

Figure 3.11-Servlet working diagram.

Source: Prepared by the author

Servlet technology. Servlet is a relatively small program that transforms the content expressed in Java into dynamic web pages through its own program, and expresses it through the server's terminal, without being controlled by the platform or protocol. As a program between the browser and the server, the transformed content is fed into the server and ultimately loaded by the server. When the Servlet program runs, it will accept requests from the client and start receiving instructions from the WEB server, and feedback the execution results to the WEB browser. Servlets will use the classes of Servlets included in projects such as Javax. which has the advantage of avoiding protocol constraints and implementing interface closure through content extensions of Javax，Servlet，GenericServlet or Javax，Servlet. The system structure

is shown in the following Figure 3.11.

Servlets have many advantages. Firstly, Servlets have strong operability, and their running results can be widely applied to internet platforms and various servers, with strong adaptability. Secondly, it has strong convenience. In the process of information query, the server only needs to be loaded once, without multiple repeated loads, and the operation and operation can be completed smoothly. Servlets also have strong security and scalability, as well as strong persistence. After a single load, they can be continuously used through system updates, without the need for additional loading of other key items and adding new links.

SSH framework. The SSH framework set is a framework set that is commonly used in most software design processes today. And this framework is based on MVC development, and the MVC pattern has become a common pattern in modern J2EE development, and is increasingly popular among developers such as JSP and PHP. The MVC mode includes Model, View, and Controller.

After the application is divided into these three major parts, each handles its own tasks. The view layer extracts user input information, submits it to the controller, and the controller decides to delegate the request to the model layer based on a certain selection. The model layer processes user requests and returns data according to the business logic code, and ultimately presents it to the user using the view layer.

The technical advantage of the SSH framework is that it consumes the least system resources and reduces the complexity of requirements for developers. Due to SSH being a system where the work between layers is relatively independent, the code coupling is low. The technological advantages of SSH enable systems developed using SSH framework technology to have strong scalability and portability. Meanwhile, adopting an open-source SSH framework can greatly simplify the complexity of system development and shorten system development time.

JavaBean Reusable Group. Users can use JavaBeans to package functionality, processing, values, database access, and any other objects that can be created using Java code, and other developers can use these objects through internal JSP pages, servlets, other JavaBeans, app programs, or applications. Users can think that

JavaBeans provide a function for copying and pasting anytime, anywhere, without worrying about any changes. In principle, JavaBean can be seen as a black box, a software device that only needs to know its functions without worrying about its internal structure. The black box only introduces and defines its external features and interfaces with other parts, such as buttons, windows, colors, shapes, handles, etc. By treating the system as a communication network associated with black boxes, we can ignore the system details inside the black boxes, effectively controlling the overall performance of the system and greatly reducing programming workload.

SQL SERVER database. Database technology originated in the 1960s and has developed rapidly, widely applied in the information society. At present, database technology, network communication, artificial intelligence, object design, and other technologies interact and promote each other, and have become the main technical characteristics of the information age. The database is mainly used to store, use and manage data. SQL Server is a new Database management system developed by Microsoft. It has many characteristics such as good security, good working performance, stable system performance, etc. It can provide users with diversified needs such as database update and storage. SQL Server adopts a client/server computing operation mode, which means that the central server is the main database and can be queried by different clients as allowed. The process of database operation is reflected in both the client and server carriers, and has strong data management capabilities.

MyEclipse enterprise integrated development environment. MyEclipse is a powerful enterprise level Integrated development environment based on Eclipse and its own plug-in. It is mainly used for the development of Java, Java EE and mobile applications. In the latest version of MyEclipse, there is also extensive support for using CodeMix, especially for various open source products and mainstream development frameworks. Supported languages and framework development such as PHP, Python, Vue, Angular, and Reac. MyEclipse is a feature rich Java EE Integrated development environment, which includes complete coding, debugging, testing and

publishing functions, and fully supports HTML, Struts, JSP, CSS, Javascript, Spring, SQL and Hibernate.

MyEclipse is an excellent collection of Eclipse plugins for developing Java and J2EE. MyEclipse has powerful features and extensive support, especially for various open source products. It can be said that MyEclipse is a proprietary eclipse development tool that covers almost all mainstream open source products, and is an indispensable Integrated development environment in the design process of various information systems.

At the beginning of modern information design for the personnel management system of vocational education institutions, we need to conduct a detailed requirement analysis of the functions and usage scenarios of this system, which is related to the subsequent research and development and direction of various functional modules of this information based personnel management system. Based on the personalized requirements of personnel management and services in vocational education institutions and the current situation of personnel management in vocational education, we have organized, refined, and summarized the information system of personnel management in vocational education institutions, in order to obtain the various functional modules of the system. In the process of requirement analysis, we need to conduct a detailed review of different user roles and functional modules, and ultimately design a modern information based personnel management system that is more standardized and procedural in business management, maximizing the various requirements and design concepts of personnel management.

Feasibility analysis. Firstly, from a technical perspective, JSP development language is widely used in various personnel management systems worldwide. Its advantages are simple debugging and low requirements for computer hardware configuration. In addition, B/S, as a mature pattern software, can provide a mature development platform based on network for personnel management systems with high speed, large capacity, high performance, and low price. Therefore, we believe that using JSP development language for personnel management systems is technically feasible.

From an economic perspective, the software used for system development is some widely used and mature software, which is more cost-effective in terms of economic investment compared to using newly developed software. Due to the relatively complete system functions of personnel management in many vocational education institutions in China, the personnel management system we have designed is a supplement and improvement to the original system. It not only retains the advantages of the original system, but also incorporates new ideas in personnel management. Based on this, corresponding functions have been improved, and it can be perfectly connected to the original system, with high economic efficiency and implementability.

Security is one of the issues that any personnel management system should pay attention to. We can verify the identity in the user settings in the newly designed system, set the corresponding permissions, set a secure firewall in the network security to ensure the communication security between the intranet and the Extranet, and use XML technology to ensure the security of resource sharing.

In summary, the personnel management system of modern information vocational education institutions has relevant feasibility.

Functional analysis. After careful sorting and analysis, we believe that users' Functional requirement for the personnel management information system mainly include setting management permissions, data search, modification and data generation, and resource sharing according to relevant templates. Users' expectations can be summarized as follows: establish a flat, concise and convenient personnel management system interface that conforms to modern operating habits, making it convenient for users to operate various functions. Establish an efficient information communication platform to facilitate communication and exchange between internal personnel and faculty in vocational education institutions. A modern informationized personnel management system should have the ability to coordinate internal personnel and departments, and improve the communication efficiency between the personnel department and other departments. Personnel with relevant permissions can easily utilize the sharing of resources and information provided by the system, reduce

unnecessary workload for personnel management personnel, and improve work efficiency. The system should establish strict system operation log management, accurately collect personnel management process records of the system, to ensure the legal and compliant implementation of personnel management work. A modern informationized personnel management system should have good network operation functions, as well as good mobile browsing and basic operation capabilities, to strengthen the system's full scenario application capabilities.

The personnel management system of vocational education institutions includes many contents that involve the entire process of personnel management. This includes the addition and import of basic information for faculty and staff in the early stage, registration of system usage accounts, tracking and management of personnel information, attendance records, salary management, recruitment management, and work process reward and punishment records. This system should be based on the actual needs of personnel management in vocational education institutions, so that the personnel information management system has rich practical functional content, such as position setting, personnel management, contract management, attendance management, salary management, teacher training management, recruitment management, and annual performance evaluation management, as shown in Figure 3.12.

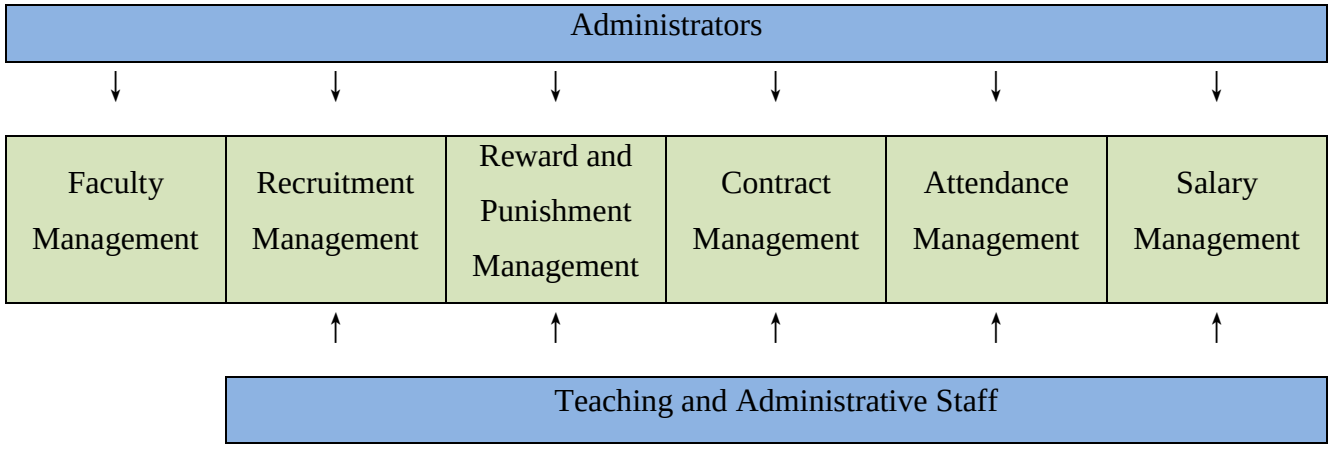

Figure 3.12- Functional structure diagram of personnel management system in modern informationization vocational education institutions.

Source: Prepared by the author

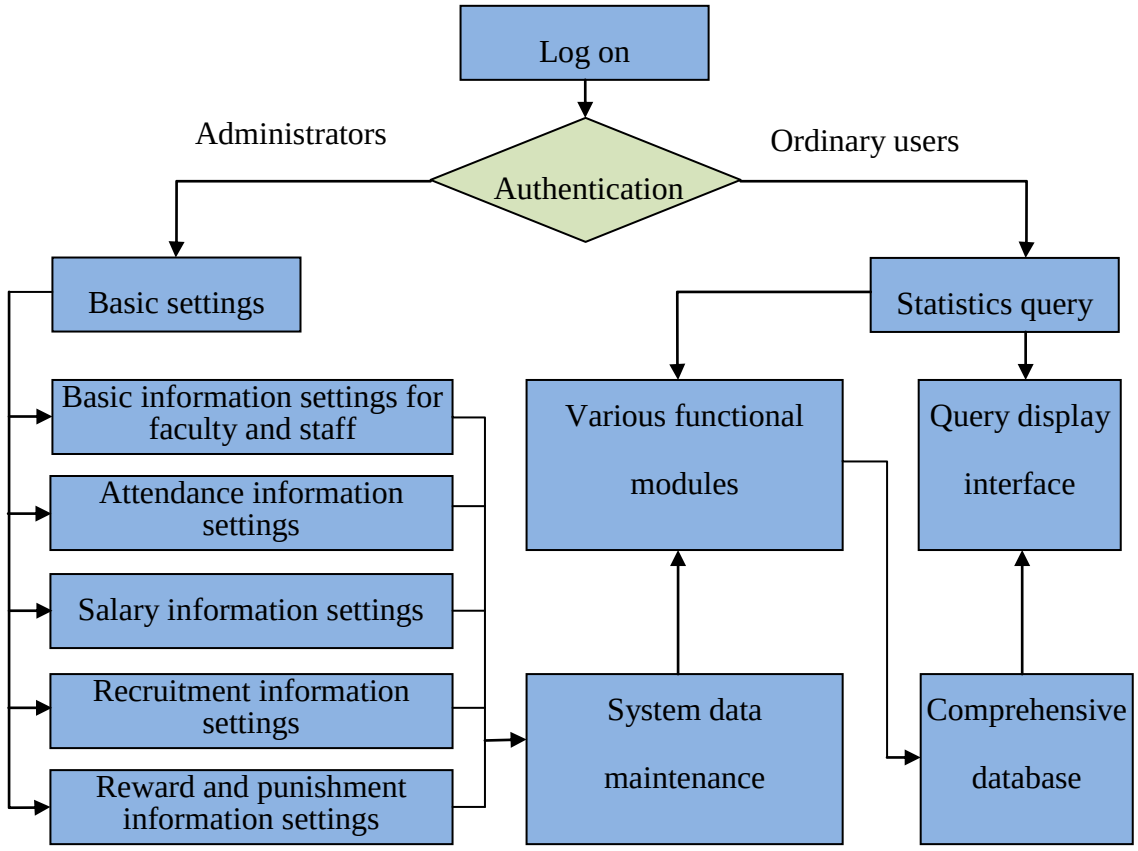

Figure 3.13-System management flowchart.

Source: Prepared by the author

Management process analysis. Considering the ease of use and functionality of the system, combined with the requirements of modern efficient and scientific management, the workflow of the personnel management system for modern information-based vocational education institutions can be determined as follows: the system automatically enters the security verification of the management system after startup, dividing visitors into two parts: tourists and registered users, and implementing corresponding authorization for these two parts of users. The system needs to set up an administrator role, who has the highest authority and the highest authorization to the system. The system management flowchart is shown in Figure 3.13.

In order to better present the effectiveness of personnel management informatization in vocational education institutions, the requirements for this system

are positioned towards a flat interface, and the operational logic should comply with the management habits and thinking logic of Chinese personnel management personnel, be efficient and convenient, and have a quick operational response. In order to facilitate the global information management of vocational education institutions, the personnel management information system should also have good compatibility and portability, as well as safe, efficient, and dynamic database management capabilities.

Based on the above feasibility analysis, functional analysis, and management process analysis, corresponding functional processes can be analyzed and customized according to the personnel management regulations and requirements of different vocational education institutions, and software development can be carried out according to the determined functional processes.

After a comprehensive needs analysis of the personnel management system of vocational education institutions, specific design and implementation can be carried out. We need to analyze the system configuration at this stage, and analyze and design the databases used in the management system, followed by the specific design and implementation of each functional module.

Considering that the development and design of the personnel management system of vocational education institutions should have good stability and adaptability, we can mainly use mature and stable Java EE and Servlet languages, use MyEclipse and choose SQL Server as the platform Database management system. Considering the diversity of computer operating systems in vocational education institutions at present, different 32-bit or 64 bit operating systems such as Windows XP or Win7/10 are allowed in the selection of operating systems, so that different computer terminals can access the personnel management system.

Design of the overall system architecture. The design of the personnel information management system for vocational education institutions is based on the fundamental principles of practicality, scalability, portability, and maintainability. It adopts a B/S structure and a hierarchical structure system based on SSH, which is easy to maintain, expand, and upgrade. This system mainly combines the files information

management, organization management, salary management, training management, performance appraisal, attendance management and other business functions of the organization, comprehensively uses various information resources, and greatly saves the cost of personnel management with the help of the personnel information management system. The refinement, accuracy, and intelligence of personnel resource management have been achieved, thereby improving the overall level of personnel resource management and providing a good platform for the further development of vocational education institutions.

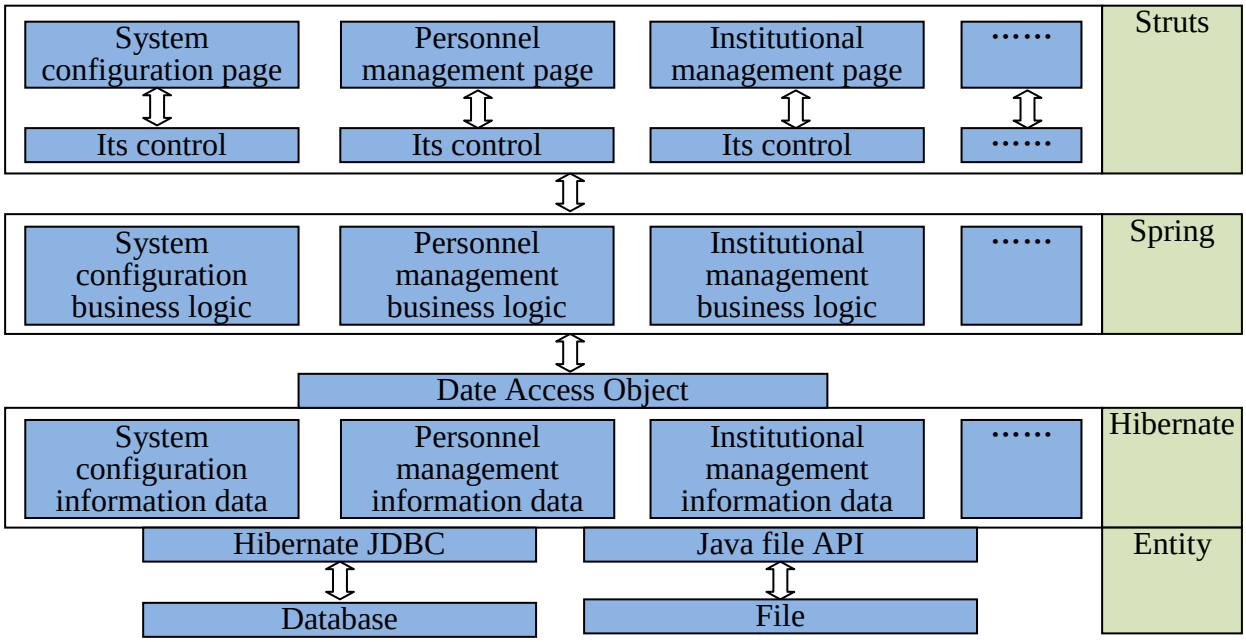

Figure 3.14-Framework diagram of personnel management information system in vocational education institutions.

Source: Prepared by the author

The system framework diagram of integrated SSH framework is shown in Figure 3.14. The system is divided into four layers in terms of responsibilities: view Presentation layer, business logic layer, data persistence layer and domain module layer. The Struts architecture system is used as the overall infrastructure of the system, and the business logic layer is supported by the Spring framework. Using Hibernate database persistence layer technology to achieve conversion and access between Java

classes and databases, Spring is ultimately responsible for maintaining and managing the business logic code of the entire system.

Design of the main functional modules of the system. At the beginning of the design of this system, by conducting sufficient market research in vocational education institutions, we gained a detailed understanding of the detailed requirements for information systems among teaching staff users and personnel management personnel in vocational education institutions. According to the hierarchical relationship and requirements of Functional requirement of personnel management, the functional modules of this system are mainly divided into the following 7, as shown in Figure 3.15.

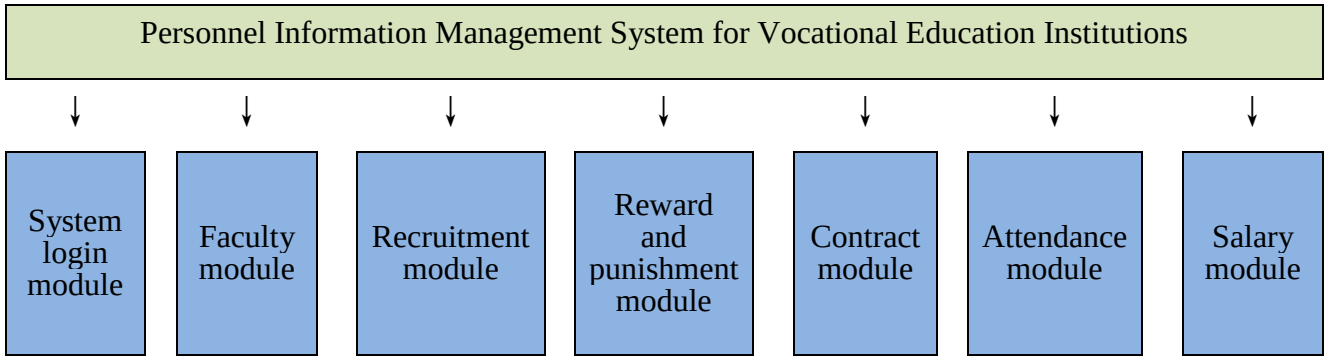

Figure 3.15- Overall system function and structure.

Source: Prepared by the author

After determining the overall functional structure of the system, we need to design processes, permissions, and views for each module of the system. Of course, this design must be developed according to different management regulations to meet the personalized needs of different vocational education institutions.

Database design. The database design of the personnel management system in vocational education institutions is the focus of the entire information system design. Only when the database can perform perfectly can the entire personnel management information system achieve optimal operational results. Excellent database design can provide strong and powerful database source support for the normal operation of

subsequent systems. After a good database design is completed, the system can effectively support the collection, organization, storage, update, query, and statistical

dissemination of relevant information, providing strong data protection for the efficient operation of the system. For database design, we should mainly consider three aspects: conceptual structure design, physical structure design, and database security design.

Conceptual structure design of database. In the practice of personnel management informatization construction in vocational education institutions, in order to integrate the actual data used in work into the database system for processing, it is necessary to transform the conceptual structure into a physical structure that is acceptable to the database, so that the database can be well compatible with its structure for work.

Firstly, the solid model needs to be transformed from a solid model to a two-dimensional table style by modifying its attributes. Afterwards, the relationship between its entities will also be transformed into a two-dimensional table style, thereby achieving a transformation of the relationship between modules.

For example, in the personnel management information system of vocational education institutions, the relevant information of teaching staff is the core and basic data of system management, so the design and division of teaching staff related information is very important. Figure 3.16 shows the E-R diagram of staff in the personnel management information system of vocational education institutions. The information in the diagram is complete and can fully meet the Functional requirement of personnel management in relevant fields.

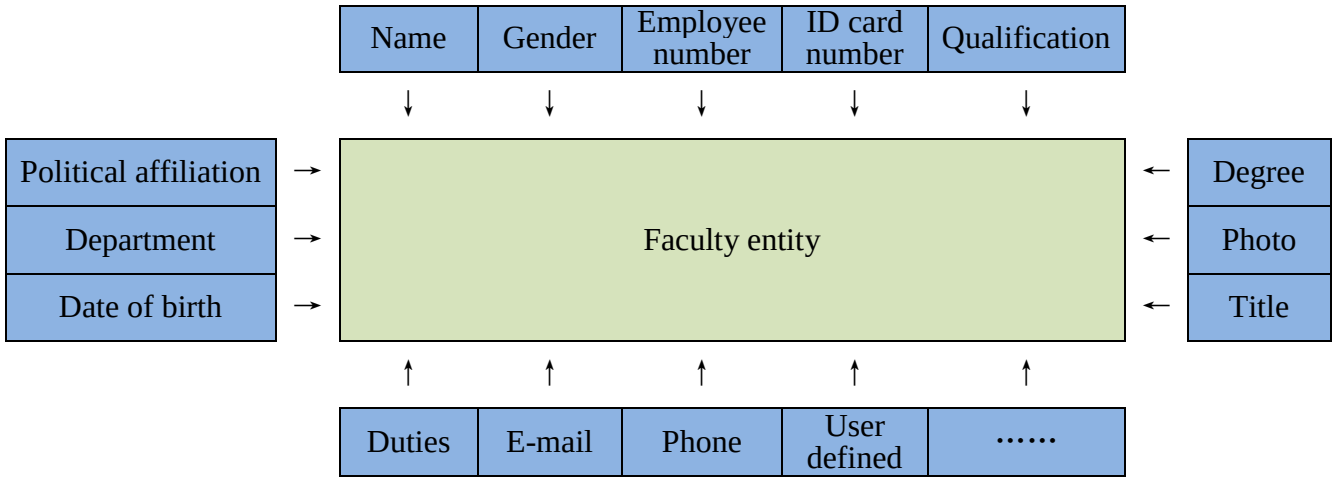

Figure 3.16- Faculty E-R diagram.

Source: Prepared by the author

Another example, in the personnel management system of vocational education institutions, the salary of faculty and staff is an important function of the system, and the input, statistics, security, and query of related information are very important. It is necessary to ensure that the data in the salary management process is tracked in place to ensure accurate, reasonable, and compliant income of faculty and staff. The input of salary information for faculty and staff is shown in Figure 3.17, which is the salary E-R diagram.

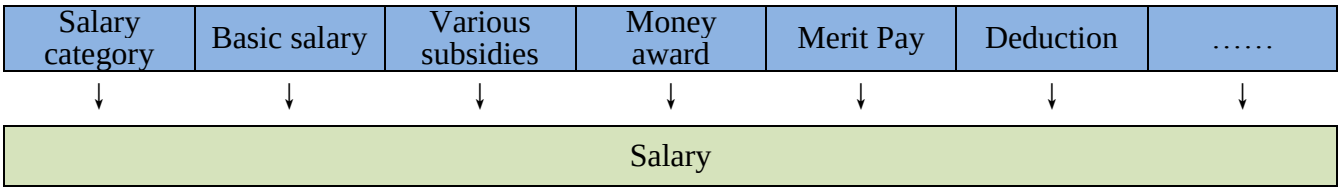

Figure 3.17- Salary E-R diagram.

Source: Prepared by the author

In addition, the attendance of faculty and staff is another important core part of the personnel management system, and its accuracy directly affects the salary income and performance evaluation of faculty and staff. For this reason, we have set up a special identity verification program for the attendance module of the teaching staff for daily management, and put their facial and positional information into the attendance entity of the teaching staff, as shown in Figure 3.18, which is the E-R diagram of the attendance entity of the teaching staff.

In summary, the conceptual structure design of the database must meet the objective requirements of personnel management, taking into account the implementation of relevant functions and having a forward-looking perspective on data preparation during design. It is recommended to avoid omissions in content and management vulnerabilities in the program during data preparation.

Physical design of databases. The physical design of a database is to transform the structural model into a two-dimensional data table within the database based on the reference conceptual structural model.

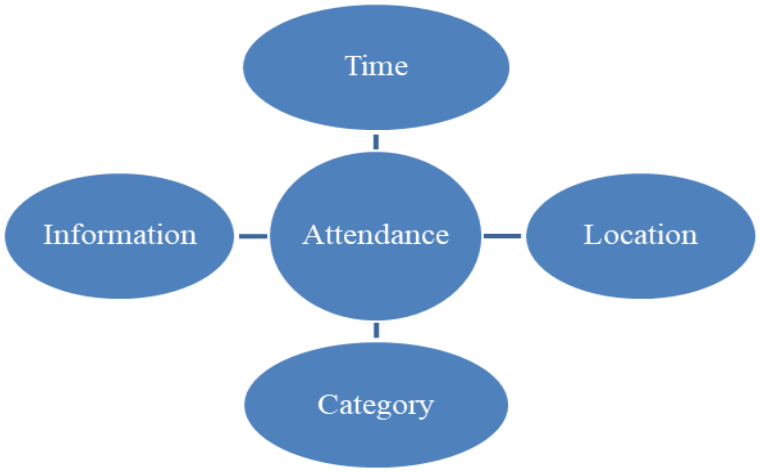

Figure 3.18- The E-R diagram of the attendance.

Source: Prepared by the author

There are many types of data tables built-in in the personnel management information system of vocational education institutions, and Table 3.1 shows the structure of the staff information table. Of course, the creation of this table is based on Figure 3.16. Other data tables in the system are also created according to their corresponding structural models by selecting appropriate data types, word lengths and other information.

Table 3.1- Employee information form.

SN	Item	Data type	Size	Empty	Primary key
1	Name	Varchar	20	×	×
2	Gender	Char	2	×	×
3	Employee number	Int	11	×	○
4	ID card number	Char	18	×	×
5	Qualification	Varchar	20	○	×
6	……	……	……	……	……

Source: Prepared by the author

Database security design. In order to ensure the security of users and all personal

data within the personnel management information system, according to the security requirements of the personnel management information system design, the system can set and control security through the following two methods.

The first is to set the system login password to invisible mode. When faculty and administrators prepare to log in to the system on the login interface, the user name and password display styles on the login interface are set to two display modes. When users input an account name, the data status of the input is visible; The system has chosen the invisible mode for password typing, hoping to improve the login security of the system in different environments to a certain extent.

The second is to manage the usage permissions of the personnel management information system. By setting admission conditions for the database, only personnel with the corresponding management permissions of the system can truly have the right to enter the internal environment management of the system through the verification process specified by the system. For ordinary users, they do not have the ability to add, delete, or modify internal data in the system. These users can only enter the designated area of the system through the interface method set by the system, and under the premise of confirming their rights, Submit modification applications, queries, and browsing of your own relevant information. Therefore, in ensuring the security of internal data, the system has achieved a reliable level of security through permission management, ensuring that system data security is within a high level of guarantee.

System business process design. The process design of a system is a very important aspect. We can use graphical methods to represent the algorithm's ideas, accurately understand the steps and links of management work, and vividly describe the processing processes that various management tasks in the computer must go through. Figure 3.19 takes the system business process as an example to show the steps and links that the personnel management information system should follow during business processing. It is an important technical document that needs to be referenced during the programming process.

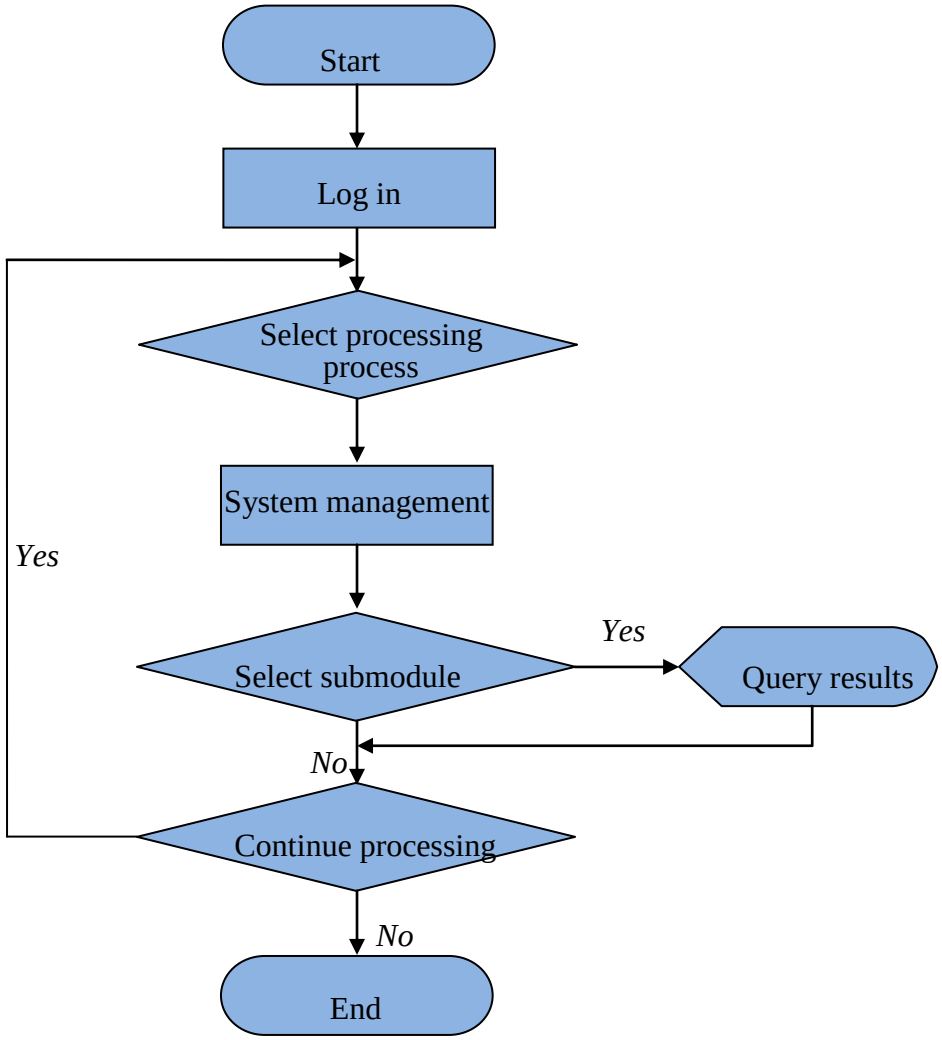

Figure 3.19- System business process diagram.

Source: Prepared by the author

System implementation. After conducting a systematic analysis of the vocational education personnel management information system and designing the overall human centered architecture, functional modules, databases, and business processes, the program design can be carried out according to these comprehensive design ideas. Following the current popular modular programming approach, program design and development will be carried out for the system login module, attendance management module, salary management module, recruitment management module, personnel information query and retrieval module, reward and punishment management module, performance management module, etc. involved in the entire system. After preliminary development, it is necessary to conduct a trial run of the program and identify potential

problems or bugs in the program design process. The tested system indicates that its security and operability have achieved the expected goals and can be put into operation, achieving all functions of personnel management informatization.

Conclusions to section 3

In the section 3, this study focuses on discussing strategies for building an innovative personnel management system in Chinese vocational education institutions. The main content is:

1. Sorted out and summarized the innovative experience of personnel management systems in foreign vocational education institutions. Among them, some countries in Europe and America, as well as Japan and other countries, have been at the forefront of world economic development for a long time, and their vocational education development has been fully guaranteed. After continuous innovation and exploration, these countries have formed a relatively scientific and effective personnel system, and many experiences and practices are worth learning from.

2. Summarized that the construction of personnel management system in vocational education institutions in China needs to be tailored to local conditions, further improve organizational system construction, smooth talent flow channels, innovate training methods for teaching staff, and focus on innovative incentive methods in order to effectively break through the existing management mode and achieve new changes, thereby maximizing the value of talents and helping vocational education institutions develop better.

3. It is proposed that innovation in the personnel management system of vocational education institutions in China must be tailored to local conditions, and innovation must be in line with their respective industrial, economic, and regional characteristics. According to the characteristics of different regions in China, this paper discusses three different strategies of personnel management system innovation based on strategic human resource management, personnel management system

innovation based on improving service level, and personnel management system innovation based on excellent performance management mode.

4. Discussed the logical starting point and main manifestations of the economic effects of vocational education in China. Firstly, the development of vocational education is a necessary aspect of economic development. Secondly, the ultimate goal of coordinated development between vocational education and the economy is win-win cooperation. At the same time, we believe that the economic effects of vocational education in China have certain selective characteristics. China's vocational education has ensured the effective implementation of its economic development strategy, promoted the continuous improvement of the soft environment for economic development, accelerated the optimization and upgrading of industrial structure, achieved rapid transformation driven by innovation, and promoted the improvement of poverty alleviation and assistance, fully reflecting the economic effects of Chinese vocational education.

5. Analyzed the existing problems that affect the economic effects of Chinese vocational education, such as a high degree of homogenization in talent cultivation, poor balance in vocational education development, imperfect cooperation mechanisms between schools and enterprises, and disconnection between talent cultivation and market demand.

6. By analyzing the main participants and functional positioning of Chinese vocational education, it is summarized that the interactive development of Chinese vocational education and economy must adhere to the principle of people-oriented development, the principle of balancing public welfare and economy, the principle of integrating localization and internationalization, the principle of clear rights and responsibilities, and the principle of multiple checks and balances. Furthermore, innovative proposals are proposed to improve the level of collaborative governance among multiple subjects, adhere to government guidance on vocational education governance, and enhance the effectiveness of industry organization guidance The guiding principle of promoting the full play of the role of enterprise entities and strengthening the independent execution ability of vocational education institutions.

7. Based on the demand for constructing a modern information-based personnel management model in vocational education institutions, the relevant technologies required for personnel management informatization are demonstrated and proposed, and the advantages and characteristics of these technologies are analyzed.

8. Analyze from three aspects: feasibility, system functionality, and management process, and demonstrate the needs of modern information based vocational education institutions' personnel management systems.

9. Elaborated on the overall architecture design points of the personnel management system in modern information vocational education institutions, the design scheme of the main functional modules of the system, database design requirements, and system business process design points, and explored the plan to achieve the informatization of the entire personnel management system.

CONCLUSIONS

Vocational education has become an important support for economic development worldwide. As is well known, vocational education can improve the quality of labor and promote employment, so vocational education and economic development are inseparable, and the two promote each other. In the process of the development of vocational education, whether the personnel management system of vocational education institutions can be innovated becomes the key to whether vocational education can generate new breakthroughs in the current stage and enhance the role of vocational education in promoting the economy. This article studies the system innovation of personnel management in Chinese vocational education institutions, and the main conclusions are as follows:

1. Under market conditions, vocational education institutions will pay more attention to connotation based development, build a new pattern of sustainable modern vocational education system, bring new opportunities for vocational education development with continuously increasing investment, further improve and develop vocational education related regulations, and more widely promote the vocational qualification certificate system. Vocational education institutions will integrate more and more profound concepts of green development and sustainable development, gradually build a platform for lifelong vocational and technical training, continuously strengthen international cooperation and exchange, use digital and information-based teaching methods to continuously improve the quality of talent cultivation, optimize talent cultivation direction based on regional economic characteristics, and further explore network-based vocational education teaching models, Pay more attention to the integration of industry and education, as well as the development of vocational education in rural and poverty-stricken areas, and break through the concept and model of traditional vocational education with the trend of cluster development. This will become the overall direction and obvious feature of the development of vocational education institutions under market conditions.

2. In combination with its own characteristics of vocational education development, China has learned from many valuable experiences of foreign vocational education development, especially in developed countries in Europe and the United States. Among them, it mainly draws on the experience of dual vocational education in Germany, the parallel experience of the general education system and vocational education system in Switzerland, and the experience of the vocational education curriculum connection system in New Zealand, Denmark's experience in the participatory, flexible, inclusive, and dynamic characteristics of its vocational education and training system, learn from Belgium's key competency education philosophy, draw inspiration from the vocational education reform ideas and vocational education systems of Chile and Australia, refer to the experience of Finland's higher vocational education degree system, learn from Luxembourg's vocational education teacher training system, and also learn from France's experience in ensuring the vocational education system. Learning from and drawing on these innovative experiences has promoted China's development process from a major vocational education country to a strong vocational education country.

3. The innovation of evaluation methods for the construction level of teaching staff in vocational education institutions is an important content of personnel management innovation in vocational education institutions. The dissertation focuses on two important aspects in the comprehensive evaluation of the construction of the teaching staff: firstly, the design of the evaluation indicator system, and secondly, the determination of the functional relationship between each indicator and the evaluation subject. After reviewing the current situation of vocational education in China and considering the requirements and trends of management and development, the dissertation innovatively proposes 4 dimensions based on the optimization of teacher structure, teacher assessment system, dual teacher, professional construction and teaching reform, totaling 15 tertiary indicators. We studied the construction of a hierarchical hierarchical structure model based on Analytic Hierarchy Process and the assignment of weights for various levels of indicators. We used Thomas L. Saaty's 1-9 and its reciprocal scaling method to construct a judgment matrix, and then used the

root method to calculate the eigenvectors of the judgment matrix. After normalization, we obtained the weights. After verifying the consistency of this weight hierarchy sequence, the final weight assignment of the indicator is determined.

4. Starting from the current situation of personnel management in Chinese vocational education institutions, combined with the existing talent internal competition mechanism and insufficient mobility in the personnel management of Chinese vocational education institutions, the backward "thing-oriented" personnel management concept, problems such as the unbalanced internal personnel structure of vocational education institutions, the lack of scientific innovation in personnel management systems, and the inefficiency caused by insufficient informationization of personnel management, it is proposed that Chinese vocational education institutions should establish a "people-oriented" management concept to motivate people's behavior and mobilize people. Based on the enthusiasm of the staff, further optimize the personnel management structure, innovate the personnel management system, comprehensively strengthen the information construction of personnel management, continuously improve the comprehensive ability of personnel management staff, focus on improving the quality of performance appraisal work, and increase personality on this basis The development trend of optimizing salary design and continuously improving the efficiency of personnel management.

5. The average annual enrollment of 28 million students in China has injected strong impetus into the country's economic development, and the economic scale of up to 16 trillion US dollars has also greatly supported the development of vocational education. The high-quality development of vocational education in China has received strong economic support. China will further strengthen the high coupling between vocational education and human capital investment, improve the level of collaborative governance among multiple entities, adhere to government guidance, enhance the effectiveness of industry organization guidance, continuously promote the role of enterprises as the main body of vocational education talent cultivation, and strengthen the independent execution ability of vocational education institutions to enhance the level and ability of interactive development between vocational education

and the economy in China. Gradually making vocational education an important factor in promoting economic development, ensuring the effective implementation of economic development strategies, continuously improving the soft environment for China's economic development, implementing the optimization and upgrading of China's industrial structure, and achieving a rapid transformation strategy driven by innovation to adapt to social and economic development.

6. The dissertation delves into the competency of managers in vocational education institutions and constructs a model. The competence of vocational education institution managers can be divided into six levels: analytical and inductive ability, decision-making and planning ability, communication and organization ability, leadership and demonstration ability, evaluation and inspiration ability, and core competitive ability. Based on this model, MC1 to MC6 conducted surveys on the competency status of vocational education institution managers in six dimensions. The results of the questionnaire survey indicate that Chinese vocational education institution managers have gained recognition from the majority of people in the tested work field, proving that Chinese vocational education institution managers have a high level of competence. This also explains from one side the phenomenon of China's vocational education being fully and rapidly developed at present. By analyzing the survey results and based on the competency model of managers in Chinese vocational education institutions, the problems and improvement strategies of the competency of managers in Chinese vocational education institutions were summarized.

7. This article sorts out and analyzes the innovative experience of personnel management systems in foreign vocational education institutions, draws on the experience and practices of scientific and effective personnel system systems in foreign countries, and summarizes the need to adapt the construction of personnel management systems in Chinese vocational education institutions to local conditions, further improve organizational system construction, smooth talent flow channels, innovate the training methods for teaching staff, and focus on innovative incentive methods, The conclusion is that only by effectively breaking through the existing management model and achieving new changes can we maximize the value of talents

and help vocational education institutions develop better. It is proposed that the innovation of personnel management system in vocational education institutions in China must be tailored to local conditions, and innovation must be in line with their respective industrial, economic, and regional characteristics. According to the characteristics of different regions in China, the dissertation discusses three different strategies of personnel management system innovation based on strategic human resource management, personnel management system innovation based on improving service level, and personnel management system innovation based on excellent performance management mode, which provides a research basis for the construction of personnel management innovation system in China's vocational education institutions.

8. The dissertation discusses the logical starting point and main manifestations of the economic effects of vocational education in China. Firstly, the development of vocational education is a necessary aspect of economic development. Secondly, the ultimate goal of coordinated development between vocational education and the economy is win-win cooperation. China's vocational education has ensured the effective implementation of its economic development strategy, promoted the continuous improvement of the soft environment for economic development, accelerated the optimization and upgrading of industrial structure, achieved rapid transformation driven by innovation, and promoted the improvement of poverty alleviation and assistance, fully reflecting the economic effects of China's vocational education. This article also analyzes the existing problems that affect the economic effects of China's vocational education, such as a high degree of homogenization in talent cultivation, poor balance in vocational education development, imperfect cooperation mechanisms between schools and enterprises, and disconnection between talent cultivation and market demand. It is proposed that the interactive development of vocational education and economy in China must adhere to the principles of people-oriented development, balancing public welfare and economic benefits, integrating localization and internationalization, clarifying rights and responsibilities, and diversified checks and balances. Furthermore, it innovatively proposes to improve

the collaborative governance of multiple entities, adhere to government guidance on vocational education governance, enhance the effectiveness of industry organization guidance, and promote the full play of the role of enterprise entities, guiding principles for strengthening the autonomous execution of vocational education institutions.

9. The dissertation demonstrates and proposes the relevant technologies required for personnel management informatization in vocational education institutions based on the demand for building a modern information-based personnel management model, and analyzes the applicability of these technologies' advantages and characteristics. At the same time, an analysis was conducted from three aspects: feasibility, system functionality, and management process to demonstrate the requirements of modern information based vocational education institutions' personnel management systems. On the basis of the above research, the overall architecture design points, main functional module design schemes, database design requirements, and system business process design points of the personnel management system of modern information vocational education institutions were elaborated. The plan to achieve the informatization of the entire personnel management system was explored, providing reference and suggestions for establishing an advanced personnel management system of vocational education institutions based on modern information and innovative technology.

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APPENDIX A

Investigation on Competence Status of Managers in Vocational Educational Institutions

Dear Manager/Teacher.

Hello! This survey is a survey and research on the competency status of managers in vocational education institutions. Please take time out of your busy schedule to read and choose the answer according to your real situation. Your authentic expression is very important to this study. This survey adopts anonymous survey. The answers you provide are only used as internal data of this research and will not be released to the public. Please do not have any concerns.

Sincerely thank you for your support and participation!

Part I: Basic Information

All the following questions are mandatory questions, please choose the correct answer according to the actual situation.

1. Your gender:

[a] male [b] female

2. Your age:

[a] 18-24 [b] 25-30 [c] 31-40 [d] 41-50 [e] 51-60

3. Your education:

[a] high school (technical secondary school) and below [b] junior college

[c] undergraduate [d] master [e] doctor

4. Your professional title:

[a] Senior [b] Senior [c] Intermediate [d] Junior [e] Ungraded

5. Teaching experience:

[a] 5 years or less [b] 6-10 years [c] 11-19 years [d] 20-29 years [e] 30 years or more

6. Teaching subjects:

[a] Professional theoretical courses [b] Practical courses [c] Integrated courses [d] Public courses [e] Others

7. Institutional situation:

07-1. Institution location:

[a] urban area [b] township [c] rural area

07-2. The nature of the institution:

[a] Public [b] Private [c] Mixed

07-3. Institution level:

[a] Secondary vocational education [b] Vocational education junior college [c] Vocational education undergraduate

07-4. Institutional level:

[a] National Demonstration Vocational College

[b] National Key Vocational College

[c] Double Higher Program Vocational College

[d] Industry-based Vocational College

[e] National Key Secondary Vocational College

[f] Provincial and ministerial level Key Secondary Vocational School

[g] Others

Part II: Business Questions and Answers

Please choose the option that you think is most suitable from the following topics.

Explanation:

CNC- Complete non-compliance

RNC- Relatively non-compliance

GC- General compliance

RC- Relatively compliance

CC- Complete compliance

1. MC1-Analysis and induction ability

Code	Topic	Evaluate

		CNC	RNC	GC	RC	CC
MC1.1	Managers can accurately match course teaching with school construction goals	○	○	○	○	○
MC1.2	Managers have a smooth channel to accept teachers' opinions and feedback on goals and management	○	○	○	○	○
MC1.3	Managers are often involved in teacher curriculum and teaching research	○	○	○	○	○
MC1.4	Managers participate in the adjustment of the talent training plan or put forward accurate revision opinions	○	○	○	○	○
MC1.5	Managers can put forward specific training requirements for students of different majors	○	○	○	○	○
MC1.6	Managers can urge teachers to check and analyze students' learning effects	○	○	○	○	○
MC1.7	Managers can accurately identify the main problems that affect students' learning and growth and correct them in time	○	○	○	○	○
MC1.8	Managers can accurately put forward the requirements for the construction of the teaching staff	○	○	○	○	○
MC1.9	Managers can have a keen insight into the problems existing in professional construction and put forward suggestions for improvement	○	○	○	○	○
MC1.10	Managers have the ability to organize efficient administrative work	○	○	○	○	○

2. MC2-Decision and planning ability

Code	Topic	Evaluate				
		CNC	RNC	GC	RC	CC
MC2.1	Managers set goals that are both ambitious and realistic	○	○	○	○	○
MC2.2	Faculty and staff generally agree with the development goals of the school	○	○	○	○	○
MC2.3	Managers set school teaching tasks and goals and transform them into classroom teaching goals	○	○	○	○	○
MC2.4	The school organization is set up reasonably	○	○	○	○	○
MC2.5	Division of labor and cooperation among various departments of the school	○	○	○	○	○
MC2.6	Managers can arrange teachers in a balanced manner and ensure that teacher development is consistent with school goals	○	○	○	○	○
MC2.7	Managers can organize teachers to develop characteristic school-based courses according to the school's situation	○	○	○	○	○
MC2.8	Schools often make decisions in the context of the most comprehensive information available	○	○	○	○	○
MC2.9	Opinions and suggestions from students and parents often bring about positive changes in school work	○	○	○	○	○
MC2.10	The school's decision-making can often be understood and actively cooperated with the implementation of the faculty and staff	○	○	○	○	○

MC3- Communication and organization ability

Code	Topic	Evaluate

		CNC	RNC	GC	RC	CC
MC3.1	Managers can understand and meet the needs of teachers in teaching and provide teaching resources for teachers and students	○	○	○	○	○
MC3.2	Administrators can communicate goals to everyone in the school and monitor the progress of goals	○	○	○	○	○
MC3.3	Administrators encourage teachers to improve their teaching expertise and provide teachers with opportunities for professional development	○	○	○	○	○
MC3.4	Managers can share in time the new ideas acquired by teachers during their training	○	○	○	○	○
MC3.5	Administrators encourage teachers to observe each other's courses and advocate for new instructional technology techniques	○	○	○	○	○
MC3.6	Managers can praise the outstanding performance of staff and students in public	○	○	○	○	○
MC3.7	Managers can actively attend various gatherings of students	○	○	○	○	○
MC3.8	Managers can coordinate external resources to develop courses that meet the needs of students' growth	○	○	○	○	○
MC3.9	Administrators engage and encourage staff to engage directly with students and parents	○	○	○	○	○
MC3.10	Have a good relationship with other schools and carry out healthy competition on the basis of cooperation	○	○	○	○	○

MC4- Leadership and demonstration ability

Code	Topic	Evaluate				
		CNC	RNC	GC	RC	CC
MC4.1	Administrators publicly articulate the goals that all students and faculty are striving to achieve	○	○	○	○	○
MC4.2	Managers have a strong sense of responsibility to lead faculty and staff to achieve their goals	○	○	○	○	○
MC4.3	The school can continuously track the progress of the achievement of work goals	○	○	○	○	○
MC4.4	Faculty support the work of administrators	○	○	○	○	○
MC4.5	Faculty agree with the manager's leadership philosophy	○	○	○	○	○
MC4.6	The school has an efficient management style and management method	○	○	○	○	○
MC4.7	Teachers have platforms and channels to improve their professional level through professional training	○	○	○	○	○
MC4.8	Managers can guide all staff to have a deep understanding of the wishes and needs of students and parents	○	○	○	○	○
MC4.9	Managers establish and lead the management concept that all work of the school is centered on talent cultivation	○	○	○	○	○
MC4.10	Managers can go deep into educating people on the front line, analyze and solve problems in the front	○	○	○	○	○

	line in a timely manner					

MC5- Evaluating and inspiring ability

Code	Topic	Evaluate				
		CNC	RNC	GC	RC	CC
MC5.1	The school can fairly, justly and accurately evaluate the working conditions of the teaching staff	○	○	○	○	○
MC5.2	School evaluation should be fair and reasonable	○	○	○	○	○
MC5.3	The evaluation of school titles is fair, scientific and reasonable	○	○	○	○	○
MC5.4	Managers have clear, consistent values that guide the way we work	○	○	○	○	○
MC5.5	Faculty have a clear understanding of where to go to succeed	○	○	○	○	○
MC5.6	Business planning is continuous and involves everyone	○	○	○	○	○
MC5.7	Managers can accurately evaluate the construction of teaching staff	○	○	○	○	○
MC5.8	Managers can scientifically guide the personalized career development of faculty and staff	○	○	○	○	○
MC5.9	Faculty and staff agree with the school work summary and are willing to continue to work in accordance with the school work plan	○	○	○	○	○
MC5.10	Students are satisfied with the educational environment and become more and more diligent	○	○	○	○	○

MC6- Core competitive ability

Code	Topic	Evaluate				
		CNC	RNC	GC	RC	CC
MC6.1	Managers can effectively use school funds to support and ensure the development of various work in the school	○	○	○	○	○
MC6.2	Managers can ensure that the teaching of various subjects is carried out normally	○	○	○	○	○
MC6.3	Managers can lead the school administrative system to actively support teaching and research activities	○	○	○	○	○
MC6.4	The school has a reasonable system to support and guarantee the development of teaching activities	○	○	○	○	○
MC6.5	The school has a strong sense of quality for survival	○	○	○	○	○
MC6.6	Managers have the ability to guide teachers in teaching and scientific research	○	○	○	○	○
MC6.7	Managers have the awareness of promoting the comprehensive and healthy development of students	○	○	○	○	○
MC6.8	Managers can encourage teachers to adopt diversified evaluation methods to evaluate students	○	○	○	○	○
MC6.9	Managers win the understanding and support of parents, higher authorities and the society for the various work of the school	○	○	○	○	○
MC6.10	Managers can create a safe and pleasant teaching environment	○	○	○	○	○

APPENDIX B

Outline of Interviews on the Construction of Teachers in Vocational Education Institutions

Hello! It is a great pleasure to have the opportunity to meet with you and communicate with you on the topic of teacher team building. Thank you for taking the time to accept my interview, thank you!

1. Please introduce your views on the construction of teachers in vocational education institutions.

2. What indicators do you think are mainly involved in the construction of teachers in vocational education institutions?

3. What do you think is the most important aspect in the construction of teachers in vocational education institutions?

4. What do you think are the main problems in the construction of teachers in vocational education institutions in my country?

5. What kind of problems exist in the construction of teaching staff in the vocational education institutions you are most familiar with?

6. According to your identity (manager, teacher, student, employer), please talk about your thoughts on the construction of the teaching staff.

7. What do you think needs to be strengthened to solve the problems existing in the construction of the current teaching staff?

8. Do you think the current severe employment situation in China and the pressure of economic development can find the answer from the construction of teaching staff? If so, what should be done?

9. In your opinion, how to evaluate the level of teaching staff construction is more objective?

Thank you again!

APPENDIX C

Outline of Leadership Interviews for Managers of Vocational Educational Institutions

Hello! I am very glad to have the opportunity to hear your valuable opinions on the leadership of managers of vocational education institutions! Thank you very much for your support and help! Thanks!

1. In what ways do you think the ability and quality of managers of vocational education institutions can affect the normal work?

2. What abilities and qualities do you think managers of vocational education institutions should possess?

3. What abilities and qualities do you think are the basic qualities that leaders of vocational education institutions should possess?

4. As a manager/teacher/student, which aspect of the manager's ability do you value most?

5. Do you think the managers around you have the abilities and qualities you mentioned? If the answer is no, what kind of ability and quality do they lack the most?

6. What do you think is the cause of the manager's lack of ability?

7. In your opinion, how to improve the ability and quality of managers?

Thanks again for your support!