Exploration on the High-Quality Development Path of Vocational Education During the "15th Five-Year Plan" Period from the Perspective of Huang Yanpei's Vocational Education Thought

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Abstract: At the critical stage of the full implementation of the "15th Five-Year Plan", vocational education serves as the core link connecting the education chain, talent chain, industrial chain, and innovation chain. Its high-quality development is directly related to China's economic transformation and upgrading as well as the construction process of a strong human resource country. The vocational education thought founded by Mr. Huang Yanpei, with "socialization" as its core essence, contains profound wisdom of the synchronous development of vocational education and social progress. This paper systematically sorts out the historical evolution and core connotation of Huang Yanpei's vocational education thought, and deeply analyzes the development trends of vocational education in fields such as specialty construction, curriculum system, school-running model, and teaching scenarios, combined with the era background of China's industrial structure adjustment and accelerated technological transformation during the "15th Five-Year Plan" period. Through a comparative study of history and reality, this paper proposes a socialized development path based on Huang Yanpei's thought, including establishing a dynamic specialty adjustment mechanism, constructing a three-dimensional literacy cultivation system, innovating the government- enterprise-school collaborative organizational form, and building a virtual-real integrated teaching ecology. Corresponding countermeasures and suggestions are also put forward to address the challenges in implementation, providing theoretical reference and practical guidance for the high-quality development of vocational education during the "15th Five-Year Plan" period.

***Keywords*:** Huang Yanpei, vocational education thought, 15th Five-Year Plan, high-quality development, integration of industry and education

1. Introduction

Vocational education is an important part of the national education system and human resource development, undertaking the important responsibilities of cultivating diversified talents, inheriting skills and techniques, and promoting employment and entrepreneurship. The report of the 20th National Congress of the Communist Party of China clearly proposes to "coordinate the collaborative innovation of vocational education, higher education, and continuing education, promote the integration of vocational and general education, integration of industry and education, and integration of science and education, and optimize the type positioning of vocational education"[2], which has set the direction for the development of vocational education in the new era. With the approaching of the "15th Five-Year Plan" (2026-2030), China's vocational education is in a critical period of transformation from scale expansion to quality improvement, facing multiple challenges such as the upgraded demand for technical and skilled talents driven by industrial upgrading, the reform of teaching models caused by digital transformation, and the expansion of educational supply due to the demand for lifelong learning.

As a pioneer of modern Chinese vocational education, Huang Yanpei's vocational education thought has stood the test of a century of practice and still has important practical guiding significance today. Since the establishment of the China Vocational Education Association in 1917, his concepts such as "enabling the unemployed to have jobs and the employed to enjoy their jobs", "combining hands and brains", and "integrating doing and learning" have profoundly revealed the essential laws of vocational education[1]. Under the current era proposition of high-quality development of vocational education, re-exploring the contemporary value of Huang Yanpei's vocational education thought and combining historical wisdom with practical needs have important enlightenment for solving practical problems such as "supply-demand mismatch" and "separation between schools and enterprises".

This paper adopts the methods of literature research, historical research, and comparative research. Firstly, it systematically sorts out the core connotation and practical experience of Huang Yanpei's vocational education thought. Secondly, it analyzes the new situation and development trends faced by vocational education during the "15th Five-Year Plan" period. Finally, based on the core of Huang Yanpei's "socialization" thought, it constructs a high - quality development

path from four dimensions and puts forward safeguard measures, providing theoretical support for the reform and development of vocational education.

2. Core Connotation and Historical Practice of Huang Yanpei's Vocational Education Thought

2.1 Ideological Origin: Formation Background and Development Process

Huang Yanpei's vocational education thought emerged during the period of drastic social changes in the late Qing Dynasty and early Republic of China, when China was facing the severe contradiction between traditional education and the development of modern industry. After the abolition of the imperial examination system in 1905, new-style schools gradually emerged, but their educational content still focused on classics reading and lacked practical skills training, leading to the widespread phenomenon of "graduation equals unemployment". At the same time, the initial development of national capitalist industry and commerce urgently needed a large number of technical workers, resulting in a sharp contradiction between talent supply and demand.

Against this background, Huang Yanpei gradually formed a distinctive theoretical system by investigating the experience of vocational education in Europe and America and combining it with China's reality. In 1913, he published "A Discussion on the Adoption of Pragmatism in School Education" in Education Magazine, criticizing the malpractice of "separation of learning and application" in traditional education. In 1917, the China Vocational Education Association was established and issued the "Manifesto of the China Vocational Education Association", marking the formal establishment of his vocational education thought system[1]. This system takes solving social employment as the starting point, serving national industrialization as the goal, and emphasizes the organic combination of education and occupation.

2.2 Core Essence: Four Pillars and Practical Manifestations

2.2.1 Socialization of School-Running Purpose

Huang Yanpei clearly put forward the four purposes of vocational education: "promoting the development of personality; preparing for personal livelihood; preparing for personal service to society; preparing for the improvement of productivity of the country and the world"[1], closely combining personal development with social progress and national prosperity. He emphasized that "the only life of vocational education institutions lies in socialization", advocating that vocational schools should be established based on "investigating local conditions and examining social needs".

In practice, the China Vocational School founded in 1918 set up majors such as carpentry, ironworking, and business according to the needs of Shanghai's industry and commerce. Its campus was located in the southwest industrial zone of Shanghai to facilitate students' internships and employment. This model of "setting up schools based on local conditions and majors based on needs" became a model for the socialized operation of modern vocational education.

2.2.2 Holistic Development of Training Objectives

"Enabling the unemployed to have jobs and the employed to enjoy their jobs" is a classic summary of the training objectives. "Having jobs" focuses on solving employment through skill training, while "enjoying jobs" emphasizes improving professional identity and spiritual realm. Huang Yanpei pointed out: "Vocational education not only teaches students a skill, but also teaches them the principles of being a person", advocating the cultivation of talents with "dedication and teamwork spirit"—"dedication" requires striving for excellence, and "teamwork spirit" emphasizes team cooperation and social responsibility[1].

The China Vocational School integrated the concept of "the sanctity of labor" into campus culture, requiring students to "combine hands and brains", offering moral cultivation courses and professional ethics courses, and cultivating professional literacy through daily norms, forming a holistic training model of "skills + literacy".

2.2.3 Diversification of School-Running Subjects

To address the problem of insufficient school-running resources, Huang Yanpei proposed the "grand vocational education doctrine", advocating that "running vocational education must strive to communicate and cooperate with all educational and professional circles"[1], breaking the closed state of education circles running schools independently. Members of the China Vocational Education Association included people from the education circle (such as Cai Yuanpei), business circle (such as Rong Desheng), and political circle (such as Huang Fu), forming a governance structure with the participation of multiple subjects. In the process of running schools, industrialists were invited to serve as school directors to participate in professional planning, and technical backbones from enterprises were hired as part-time teachers to ensure that talent training was synchronized with industry needs.

2.2.4 Practicality of Teaching Methods

To overcome the malpractice of "empty talk" in traditional education, Huang Yanpei put forward the principles of "combining hands and brains" and "integrating doing and learning", emphasizing that "what vocational education pays most attention to is practical work, and books are only tools to assist practical work"[1]. The China Vocational School established a sound practical training system: the carpentry department set up an internship workshop, and the business department set up a simulated bank and store. Students studied theory in the morning and practiced in the afternoon, realizing "learning through doing and doing through learning". At the same time, the "work-study system" was implemented to help poor students earn remuneration through labor, solving the problem of tuition fees while improving their abilities.

2.3 Historical Value: Practical Effects and Ideological Foundation

Huang Yanpei's vocational education thought had a far-reaching impact on modern China. By 1947, there were more than 1,600 vocational schools across the country, and the China Vocational Education Association had established more than 30 branches in various places, forming a national vocational education network. Graduates were active in fields such as industry, commerce, agriculture, and forestry, providing important talent support for modern industrialization. More importantly, this thought established the independent type positioning of vocational education, proved its unique value in promoting employment and developing production, and laid the ideological foundation for the establishment of China's modern vocational education system[8].

3. Era Background and Trend Characteristics of High-Quality Development of Vocational Education During the "15th Five-Year Plan" Period

3.1 Era Background: Coexistence of Opportunities and Challenges

3.1.1 Industrial Upgrading Forces the Reform of Talent Supply

As China's economy shifts from high-speed growth to high-quality development, the industrial structure is undergoing profound changes. According to the data from the "14th Five-Year Plan" for Vocational Skills Training, the talent gap in fields such as high-end manufacturing, modern services, and the digital economy increases by 12% annually on average, and the transformation and upgrading of traditional industries also require a large number of skilled talents with new technology application capabilities. This situation puts forward higher requirements for the specialty setting and training standards of vocational education, and it is urgent to establish a talent training mechanism that is in sync with industrial development.

3.1.2 Digital Transformation Reshapes the Educational Form

The rapid development of technologies such as artificial intelligence, big data, and the Internet of Things has not only changed the mode of production but also exerted a profound impact on the teaching model. On the one hand, technologies such as virtual simulation and digital twin provide new means for practical teaching, enabling high-risk and high-cost training programs to be carried out beyond time and space constraints. On the other hand, digital skills have become a general requirement in various industries, so vocational education needs to integrate digital literacy cultivation into the entire teaching process of various majors[7].

3.1.3 The Demand for Lifelong Learning Expands the Educational Boundary

Under the goal of building a learning society where "everyone can learn, everywhere can learn, and always can learn", vocational education is no longer limited to academic education but also needs to undertake the responsibilities of lifelong education such as skill improvement and job transfer training. Data from the Seventh National Population Census shows that 68.3% of the working-age population aged 25-64 in China have the demand for skill improvement[3], which requires the vocational education system to develop in a more open and flexible direction.

3.2 Trend Characteristics: Four Development Transitions

3.2.1 Specialty Construction: From "Discipline-Oriented" to "Demand-Oriented"

The specialty setting of traditional vocational education has the problem of "valuing theory over practice and inheritance over innovation", leading to the coexistence of "difficult employment" for graduates of some majors and "difficult recruitment" for enterprises. During the "15th Five-Year Plan" period, specialty construction will pay more attention to market demand research and establish a closed-loop mechanism of "industrial demand → specialty setting → talent training → employment feedback". For example, in response to the development of the new energy vehicle industry, more than 200 vocational colleges across the country have added the major of new energy vehicle testing and maintenance; to meet the needs of the rural revitalization strategy, agricultural vocational colleges have generally added majors such as smart agriculture and rural tourism[3].

3.2.2 Curriculum System: From "Knowledge-Based" to "Competence-Based"

The accelerated technological iteration has promoted the transformation of the curriculum system: first, the content is connected with vocational standards, incorporating new technologies and processes of the industry; second, the structure is modular, setting up core courses, directional courses, and elective courses to meet personalized needs; third, the evaluation is diversified, replacing the single theoretical examination with process evaluation and practical achievement evaluation[4].

3.2.3 School-Running Model: From "Separation of School and Society" to "Integration of Industry and Education"

The integration of industry and education is the key to solving the problem of "separation between schools and enterprises". During the "15th Five-Year Plan" period, the government will establish a policy incentive mechanism to provide tax reductions and land guarantees for enterprises participating in school-running; schools and enterprises will jointly build industrial colleges and training bases; industries will play a bridging role in formulating training standards and participating in quality evaluation, promoting in-depth integration of industry and education[6].

3.2.4 Teaching Scenarios: From "Campus-Closed" to "Virtual-Real Integration"

In the future, teaching scenarios will present the characteristics of "combination of virtual and real, and linkage between internal and external": "teaching factories" and "virtual workshops" will be built on campus to simulate the production environment; enterprise workshops and community service centers will become off-campus teaching sites, realizing the integration of "classroom and workshop, teacher and master, student and apprentice" through "alternation of work and study" and "on-the-job internship"[7].

4. Contemporary Transformation and Practical Path of Huang Yanpei's Vocational Education Thought

4.1 Constructing a Socialized Specialty Adjustment Mechanism to Achieve Accurate Supply-Demand Matching

Drawing on the thought of "socialization of school-running purpose", a dynamic adjustment mechanism is established:

(1) Building an Industrial Talent Big Data Platform: Led by the government, a regional platform is built in conjunction with multiple departments and industry associations to monitor industrial talent gaps and skill demands in real-time. For example, the "Industry-Education Integration Information Service Platform" in Jiangsu Province provides data support for specialty adjustment in colleges and universities[3].

(2) Implementing the "Specialty Group + Industrial Group" Connection: Specialty groups are established around local leading industries to achieve accurate matching between the specialty chain and the industrial chain. For example, Shenzhen Polytechnic has built a specialty group covering the Internet of Things, artificial intelligence, and other majors for the electronic information industry cluster, with the employment rate of graduates exceeding 98% for consecutive years[4].

(3) Setting Up a Special Fund for Dynamic Adjustment: Financial support is provided to colleges and universities that add or adjust majors. At the same time, a specialty early warning mechanism is established to restrict enrollment or close majors with an employment rate of less than 60% for three consecutive years[2].

4.2 Building a Holistic Literacy Cultivation System to Improve the Quality of Talent Training

Adhering to the concept of "dedication and teamwork spirit", a system of "integrating moral and technical education, and combining work and study" is constructed:

(1) Developing "Three-Dimensional and Six-Literacy" Curriculum Modules: With vocational skills, professional literacy, and digital literacy as the three dimensions, six literacies such as craftsmanship spirit and innovation ability are integrated, and characteristic textbooks are compiled. For example, Qingdao Technical College integrates case teaching of "Haier Craftsmanship Spirit" into its courses[5].

(2) Implementing the "Dual Tutors + Dual Bases" Model: Each student is equipped with dual tutors from the school and enterprise. Basic training is carried out at the on-campus base, and participation in actual production at the enterprise base helps temper skills and professional spirit.

(3) Constructing the "Post-Course-Competition-Certificate" Integration Mechanism: Integrating post requirements, course content, competition standards, and certificate assessment to form a closed loop of "learning-doing-competing - certifying". For example, Zhejiang Institute of Mechanical & Electrical Engineering integrates the content of industrial robot vocational skill level certificates into its courses, improving students' employability[3].

4.3 Innovating Diversified School-Running Organizational Forms to Stimulate School - Running Vitality

Practicing the "grand vocational education doctrine", a pattern of multi-party participation is constructed:

(1) Building Entity Industrial Colleges: Colleges and universities and leading enterprises jointly establish industrial colleges in accordance with the principle of "joint discussion, construction, management, and sharing", implementing the council-led system. For example, Wuxi Institute of Technology and Siemens jointly built the Intelligent Manufacturing Industrial College, with the enterprise donating 120 million yuan worth of training equipment[6].

(2) Establishing Regional Industry-Education Consortiums: Taking cities and prefectures as units, the government takes the lead in integrating resources from colleges and universities, enterprises, and scientific research institutions. For example, the Industry-Education Consortium of the Yangtze River Delta Ecological Green Integration Development Demonstration Zone realizes the optimal allocation of resources in Shanghai, Jiangsu, and Zhejiang[3].

(3) Improving Incentive Policies for School-Enterprise Cooperation: Preferential policies such as enterprise tax reductions and income tax credits are implemented. School-enterprise cooperation is included in the enterprise social responsibility evaluation, and an enterprise school-running cost compensation mechanism is established to provide subsidies to enterprises according to the number of interns accepted[2].

4.4 Creating a Virtual-Real Integrated Teaching Ecology to Innovate Educational and Teaching Models

Inheriting the tradition of "integrating doing and learning", technology is used to innovate teaching:

(1) Building Virtual Simulation Training Centers: National and provincial training centers are built around high-risk and high-end fields. For example, the Coal Mine Safety Virtual Simulation Training Center of Chongqing Vocational Institute of Engineering simulates dangerous scenarios for safety training[7].

(2) Implementing Blended Teaching Models: Relying on the "Internet + Vocational Education" platform to provide online resources, classroom teaching focuses on case analysis and project practice to improve learning flexibility.

(3) Carrying Out "Service-Oriented" Practical Teaching: Students are organized to participate in social practice through voluntary services and technical assistance. For example, students majoring in social work at Changsha Social Work College participate in community elderly care services, realizing "serving through learning and promoting learning through service"[5].

5. Safeguard Measures and Implementation Suggestions for the High-Quality Development of Vocational Education During the "15th Five-Year Plan" Period

5.1 Strengthening Policy Support and Optimizing the Institutional Environment

(1) Improving Laws and Regulations: Revise the implementation regulations of the Vocational Education Law to clarify the rights and obligations of the government, enterprises, schools and other entities in the integration of industry and education; formulate local regulations on the high-quality development of vocational education in accordance with local conditions, and refine supporting policies such as financial investment, land guarantee, etc., to provide legal protection for the development of vocational education[2].

(2) Increasing Financial Investment: Establish a per-student funding system for vocational education linked to school-running scale, training costs and school - running quality, ensuring that the standard of per-student financial appropriation for vocational colleges is not lower than that of ordinary education institutions at the same level. Set up a special fund for the integration of industry and education in vocational education, focusing on supporting the construction of industrial colleges, the upgrading of training bases, and teacher training, and guide social capital to participate in vocational education through donations and equity participation[6].

(3) Improving Supervision and Evaluation Mechanisms: Establish a vocational education evaluation system centered on quality, with industrial relevance, employment quality, and enterprise satisfaction as the main evaluation indicators. Implement the annual vocational education quality report system, regularly release information on specialty construction quality, teacher level, and training conditions, and accept social supervision. Incorporate the development of vocational education into the performance assessment of local governments to consolidate the responsibility of local governments for running schools[3].

5.2 Strengthening Teacher Construction and Enhancing Educational Capacity

(1) Improving the "Dual-Qualification" Teacher Training System: Implement the "Dual-Qualification" Teacher Quality

Improvement Plan, establish a two-way exchange mechanism between vocational college teachers and enterprise technical backbones, and require professional teachers to have at least 6 months of practice in enterprises accumulated every five years. Support vocational colleges to recruit technical talents with rich practical experience from industries and enterprises as full - time teachers, relax restrictions on academic qualifications and professional titles, and establish a teacher title evaluation standard suitable for the characteristics of vocational education[2].

(2) Building High-Level Teacher Teaching Innovation Teams: Around key specialty groups, form teaching innovation teams composed of industry experts, enterprise technical backbones, and school backbone teachers to carry out teaching research, resource development, and technical services. Solve teaching problems through teamwork, promote excellent teaching experience, and improve the overall teaching level[4].

5.3 Deepening International Cooperation and Expanding Development Space

(1) Introducing International Advanced Standards and Resources: Actively learn from international advanced vocational education models such as the German dual-system and Swiss apprenticeship system, and introduce high-quality curriculum resources, teaching standards, and evaluation systems. Establish cooperation with international organizations such as the WorldSkills Organization and the International Vocational Education Alliance, and participate in the formulation of international vocational skills standards to enhance China's international discourse power in vocational education[3].

(2) Promoting the "Going Global" Strategy of Vocational Education: In line with the needs of the "Belt and Road" Initiative, carry out cooperative education with vocational colleges in countries along the route, and export China's vocational education standards, curriculum systems, and school-running models. Support vocational colleges to "go global" together with domestic enterprises, and build skill training bases such as "Luban Workshops" overseas to train local skilled talents and serve international production capacity cooperation[4].

6. Conclusion

The "socialization" core and "integration of doing and learning" concept of Huang Yanpei's vocational education thought provide important guidance for the high-quality development of vocational education during the "15th Five-Year Plan" period. Against the background of industrial upgrading, digital transformation, and growing demand for lifelong learning, vocational education must adhere to the orientation of social needs and continuously innovate talent training models, school-running organizational forms, and teaching methods.

By constructing a socialized specialty adjustment mechanism, a holistic literacy cultivation system, a diversified school-running organizational form, and a virtual-real integrated teaching ecology, the development problems such as "supply-demand mismatch", "enthusiastic schools but cold enterprises", and "insufficient practice" in vocational education can be effectively solved, and in-depth integration with economic and social development can be achieved. At the same time, it is necessary to strengthen safeguard measures such as policy support, teacher construction, and international cooperation to create a good environment for the high-quality development of vocational education.

During the "15th Five-Year Plan" period, vocational education should be guided by Huang Yanpei's vocational education thought, based on China's national conditions, learn from international experience, deepen reform and innovation, and accelerate the construction of a modern vocational education system with Chinese characteristics and world-class standards, so as to cultivate more high-quality technical and skilled talents, craftsmen, and great craftsmen for the comprehensive construction of a modern socialist country.

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