

REVIEW ARTICLE

The transformation of Chinese vocational education in the era of globalization

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Chinese vocational education is encountering multifaceted challenges in the era of globalization. This article reviews the ongoing reform of China's vocational education system against the backdrop of the fourth industrial revolution, national modernization, and the construction of a skill-oriented society. The reform emphasizes updating educational concepts, modernizing the vocational-education system, and transforming school-running models. Key measures include innovating talent-training models, reforming enrollment systems, enhancing teacher quality, establishing governance frameworks, promoting international cooperation, advancing digital transformation, and optimizing the allocation of vocational-education resources. The reform has achieved significant outcomes, such as supporting high-quality economic growth, fostering social equity, improving the education system, and strengthening global exchanges. These efforts align with China's vision of building a modernized vocational-education system that adapts to national development needs.

Key words: globalization era, China's vocational education reform, fourth industrial revolution, skill-based society, modernization of vocational education, governance system, digital transformation

INTRODUCTION

Catalyzed by technological innovation in the fourth industrial revolution, the global economy is undergoing a transformative wave of industrial restructuring. Moreover, the burgeoning digital economy empowers the transformation and upgrading of traditional industries, thereby leading to the emergence of new industries and forms and models of business that, in turn, create new divisions of labor and employment opportunities (Carlsson, 2004). Such industrial evolution fundamentally depends on the support of highly skilled technical talents.

Vocational education, as the educational type most intrinsically connected to industrial needs and most

directly serving economic development, has the mission of establishing a hub for cultivating technical and skilled talents, providing essential human resources, and facilitating productivity conversion for the accelerated development of a modern industrial system (Blanco et al., 2018). In this new historical epoch, Chinese vocational education has been entrusted with renewed responsibilities. The vision of realizing the modernization of vocational education has consistently guided the reform practices of Chinese vocational education. Reform is crucial not only to the survival and development of vocational education but also to the cultivation of technical talent and the social recognition and reputation of vocational education.

In the Chinese context, vocational-education reform

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focuses on achieving a leap from quantitative expansion to quality enhancement (Wu & Hao, 2017). This review primarily aims to introduce China's reforms and achievements in vocational education in response to typical challenges, such as the fourth industrial revolution, during this era of globalization.

THE CONTEXT OF THE ERA RELATIVE TO CHINA'S VOCATIONAL-EDUCATION REFORM

Reform driven by the fourth industrial revolution

Currently, humanity is ushering in the fourth industrial revolution, whose main feature is the integration of various technologies (Xinhua News Agency, 2016). In turn, the rapid development of new technologies and new industries has led to an urgent demand for high-tech employees. By the end of 2021, the number of highly skilled employees in China exceeded 60 million, which represented a doubling since the end of 2010.

However, despite the massive growth in demand, highly skilled workers remain in short supply. Although the number of employees skilled in technical fields by the end of 2021 far exceeded the number of similar employees in 2010, there was a shortage of such talent in China of 20 million. By 2025, the talent-demand gap in the ten key areas of China's manufacturing industry was expected to be nearly 30 million, with a gap rate as high as 48% (Xinhua News Agency, 2023). During this critical period of industrial transformation and upgrading, China must further strengthen the cultivation of highly skilled employees to achieve its strategic development goals in intelligent manufacturing. Vocational education, being the type of education most closely aligned with industries and directly serving the economy, has the mission of creating a dedicated place for technical and skilled-talent cultivation, providing essential human resources, and facilitating productivity transformation for the accelerated construction of a modernized industrial system.

Vocational education reform helps lead Chinese modernization

The report of the 20th National Congress of the Communist Party of China (CPC) explicitly emphasized that from then on, the central task of the CPC would be to unite and lead the people of all ethnic groups to build a modern socialist power and achieve its second centenary goal of promoting a comprehensive rejuvenation of the nation through modernization. The essence of educational modernization is the continuous improvement of the human-capital level of all people (Thomas, 2005). As an important component of the national education system and human-resource

development, vocational education carries the significant responsibility of cultivating diversified employees, imparting technical skills, and promoting employment and entrepreneurship. As such, it plays a crucial role in advancing the process of constructing the Chinese path to modernization.

At China's National Vocational Education Conference held in 2021, General Secretary Xi Jinping provided important instructions for the work of vocational education: In the new journey of building a modernized socialist country, Xi said that vocational education had a promising future and great potential (Xi, 2024). The "China vocational education development report 2012-2022" pointed out that China's vocational education and modernization develop symbiotically and play important roles in terms of economic development and supporting industrial modernization (Ministry of Education of the People's Republic of China, 2022a). A high-quality vocational-education system is a crucial support for economic and social development. Therefore, to achieve the Chinese path to modernization, it is necessary to abandon the extensive economic development model, adhere to the path of connotative development, and improve the balance, coordination, and inclusiveness of development.

The call for establishing a skill-based society

Skills are the foundation of a strong nation and the basis for establishing individual careers. Moreover, skilled employees are crucial for supporting the idea of "Made in China" and play a significant role in promoting high-quality economic and social development. In June 2021, the Ministry of Human Resources and Social Security issued the "implementation plan for the 'skill China action'" and proposed at the national level the construction of "Skill China" as well as the need to make systematic institutional arrangements for the development of skilled employees (Ministry of Human Resources and Social Security, 2021). However, a gap remains between the total number, structure, training, and utilization of skilled employees, especially highly skilled workers, and the actual needs of industry.

A vision for achieving the modernization of vocational education

Since modern times, China's exploration and pursuit of vocational-education modernization has not ceased. This exploration began with "the Westernization Movement" and has gone through various stages, including seeking paths amid chaos, clarifying directions during revolutions, rectifying and restoring by discarding and retaining, expanding scale through reforms, and pursuing quality through standardization (Shen, 2023). Now, under the leadership of the CPC, a new historical chapter has been ushered in. As China's modernization progresses, the pace of the modernization of vocational

education has also accelerated. Since the reform and opening-up of China, vocational education has provided a strong workforce and intellectual support for China's economic and social development. The framework of the modern vocational-education system has been fully established, thereby enhancing the system's capacity to promote economic and social development and increasing its social appeal. As a result, the current system possesses many favorable characteristics and a solid foundation for achieving modernization.

In this new era, the modernization of vocational education faces new opportunities. Developing modern vocational education involves concept transformation, institutional innovation, system construction, and policy support to make it a comprehensive project. The vision of achieving vocational education modernization consistently guides the ongoing reform of China's vocational education.

KEY ASPECTS OF CHINA'S VOCATIONAL-EDUCATION REFORM

Updating the concept of vocational education

In the current era, China's development of vocational education places great emphasis on the concept of all-around development, which is both in the best interest of students and a requirement of modern production processes. Meeting the developmental needs of students is one of the core aspects of high-quality vocational education. As an activity that cultivates individuals, vocational education possesses both intrinsic and instrumental value, with intrinsic value being the more significant (McGrath & Yamada, 2023).

With the rapid advancement of science and technology, industrial and employment structures are constantly evolving, thereby accelerating the transformation of individual occupations. This acceleration in occupational and labor changes requires adaptability from workers. Therefore, vocational education needs to not only prepare students for existing jobs but also "cultivate an adaptability to jobs not yet imagined" and enable workers to adjust to the shift in work organization from Fordism to Post-Fordism (Stavrou & Achniotis, 2023). This type of preparation can lay the foundation for students' pursuit of lifelong learning and development and create opportunities for them to excel in life while realizing their own value.

Vocational education as a distinct category rather than an educational tier

"Decision of the State Council on accelerating the development of modern vocational education" emphasized the need to "enhance articulation between vocational and general education, thereby constructing

an 'academic flyover' that empowers students with diversified pathways to success through flexible educational choices" (State Council of the People's Republic of China, 2014a). In 2019, the "National vocational educational reform implementation plan" stated that vocational education and general education are two different types of education, each holding equally important positions, thereby officially establishing vocational education as a distinct category within the Chinese education system (State Council of the People's Republic of China, 2019).

This significant positioning endows vocational education with a distinctly Chinese character and also provides crucial policy guidance and practical implications. That is, it clarifies the connections and distinctions between vocational education and general education and indicates the developmental direction of vocational education. Moreover, it helps the vocational-education system better understand its functions and roles, further explore and refine its unique educational model and talent-training model, and more effectively serve and support the country's modernization efforts (Ministry of Education of the People's Republic of China, 2020d).

In 2021, the "Opinions on promoting the high-quality development of modern vocational education" identified this prominent position as the logical starting point for planning vocational-education initiatives. The document emphasized consolidating and optimizing this positioning, adapting to local conditions, and promoting the coordinated development of vocational education and general education (State Council of the People's Republic of China, 2021a). This opinion document was based on the study of educational and industrial laws and the career-growth patterns of technically skilled employees with the aim of establishing vocational education as a type of education with broad appeal and specific functions.

In May 2022, the promulgation of the revised "The law of the People's Republic of China on vocational education" marked the nation's formal recognition through legislation that vocational education holds an equally important status as general education. It thereby provided legal assurance for the transition of vocational education from level to type. Paragraph 1 of the law stipulated that "vocational education is a type of education that holds an equally important position as general education. It is an integral part of the national education system and human resource development, and serves as a crucial pathway for cultivating diversified talents, inheriting technical skills, and promoting employment and entrepreneurship" (Ministry of Education of the People's Republic of China, 2022b).

Vocational education upholds the fundamental principle of "fostering virtue through education"

The primary issue in education is determining what kind of individuals to cultivate. Chinese vocational education has consistently embraced this philosophy by integrating the cultivation of individuals and talent, and it is committed to nurturing high-quality, technical talent, skilled craftsmen, and national-level master artisans. The "National medium- and long-term education reform and development plan (2010-2020)" stipulated that prioritizing the cultivation of individuals is the fundamental requirement of educational work. That is, the Chinese nation has always esteemed the cultivation of a moral population and believed that "virtue is the commander of talent", thus placing importance on the shaping of personal character (Ministry of Education of the People's Republic of China, 2010).

As such, vocational education inherits and carries forward the Chinese nation's tradition of valuing virtue and focusing on the comprehensive growth and success of students. It integrates the cultivation of core socialist values into the entire process of talent cultivation. To accomplish this goal, vocational education in China requires the significant advancement of the curriculum's ideology and politics. It also promotes the alignment and parallel development of professional courses along with ideological and political courses and balances the imparting of foundational knowledge with the cultivation of professional abilities. In this way, vocational education emphasizes both theory and practice by integrating technology and the humanities and ensuring that students achieve comprehensive development in terms of virtue, intellect, physique, aesthetics, and labor.

Vocational education firmly emphasizes the idea of practical education

Practical education is the distinguishing feature of vocational education compared to other type-based education. If students are unfamiliar with production front lines and teachers are not acquainted with the latest technologies that are applied in industry, vocational education will not be able to cultivate students who meet the needs of enterprises (Ministry of Education of the People's Republic of China, 2021). China's development of vocational education firmly establishes the concept of practical education by treating the integration of industry and education and school-enterprise cooperation as important industrial and educational policies. These approaches are therefore integrated throughout the entire process of developing talent through vocational education. This integration promotes a pattern of positive interaction between industry and education that leads to both schools and enterprises enjoying complementary benefits.

China regards the integration of industry and education

as the fundamental path for developing vocational education. Emphasizing integrated development is one of the eight fundamental concepts for advancing educational modernization. In 2017, the "Opinions of the State Council on deepening the integration of industry and education" required, deepening the integration of industry and education and promoting the organic connection between the education chain, talent chain, and the industrial chain and innovation chain is an urgent requirement for advancing the supply-side structural reform of human resources (State Council of the People's Republic of China, 2017).

Vocational education increasingly emphasizes education for employment

Employment is the foundation of people's livelihoods. Vocational education is the component of the national education system that is most closely aligned with labor-market demands. As such, it bears the significant responsibility of supplying society with hundreds of millions of high-quality workers and specialized talents. Therefore, it must innovate and reform with an employment-oriented approach for the purpose of shifting students from "being able to find jobs" to "finding good jobs" (Ling et al., 2023).

China continuously optimizes the structure of vocational education, upgrades the talent-cultivation system, enhances employment and entrepreneurship capabilities, and promotes full and high-quality employment for students. On the one hand, the selection of available major fields of study is closely aligned with market demand. China strengthens the effective regulation of the talent supply by the employment market by ensuring that the development of vocational-school majors is dynamically aligned and in sync with industrial development. Vocational-education majors are subject to overall planning, dynamic adjustment, and autonomous setting. The professional catalog undergoes a major revision every five years and is updated dynamically each year. Except for undergraduate and nationally controlled majors, vocational schools independently establish majors within the catalog based on regional development and market demand and may apply to establish majors outside the catalog. On the other hand, the training content is closely aligned with the jobs that are currently available. Vocational schools align with the new economy, new forms of business, and new professions by promptly incorporating advanced elements of new technologies, processes, and standards into teaching standards and content.

Improving the modern vocational-education system

As a distinct category of education, vocational education functions as an interconnected system that integrates various components and establishes operational

mechanisms. In this way, it serves as both the foundation of and vehicle for effective skills development. The CPC and the Chinese government have consistently prioritized the development of the vocational-education system as a long-term strategic objective and demonstrated a strong commitment to its continuous advancement and improvement (Ping & Li, 2017).

In the 21st century, China began exploring the construction of a vocational-education system capable of meeting the challenges of globalization. In 2002, the "Decision of the State Council on vigorously promoting the reform and development of vocational education" proposed a modern vocational-education system that can "adapt to the socialist market economy system, closely integrate with market demand and employment, and be structurally reasonable, flexible, open, distinctive, and self-developing" (State Council of the People's Republic of China, 2002). Building on this document, the 2005 "Decision of the State Council on vigorously developing vocational education" further proposed a modern vocational education system that achieves the goals proposed in 2002 as well as meets the lifelong learning needs of the people, incorporates school-enterprise cooperation and the combination of work and study, is structurally reasonable, diverse in form, flexible, open, self-developing, and possesses Chinese characteristics (State Council of the People's Republic of China, 2005b).

The "National medium- and long-term education reform and development plan (2010-2020)" had proposed that "by 2020, a modern vocational education system will be established to meet the requirements of economic development transformation and industrial structure adjustment, embody the concept of lifelong education, and achieve coordinated development of secondary and higher vocational education" (Ministry of Education of the People's Republic of China, 2010). In 2014, the "Decision of the State Council on accelerating the development of modern vocational education" provided a more detailed description of the desired modern vocational-education system (State Council of the People's Republic of China, 2014a). It proposed establishing a system that meets development needs, deeply integrates industry and education, connects secondary and higher vocational education, facilitates communication between vocational education and general education, embodies the concept of lifelong education, and is characterized by Chinese features and world-class standards. In June of the same year, the Ministry of Education and five other departments issued the "Plan for the construction of a modern vocational education system (2014-2020)", which outlined the basic structure, key tasks, institutional guarantees, and mechanism innovations of the modern vocational-education system (Ministry of Education of the People's

Republic of China, 2014a). This plan proposed a framework and overall layout of the modern vocational-education system that serves demand, is open and integrated, allows students to enter higher schools, and facilitates communication in line with the concept of lifelong education.

The hierarchical structure of Chinese vocational education consists of the following three parts. First, in areas where it is needed, elementary vocational-education schools, training institutions, and employers conduct training in practical and technical skills that enable learners to acquire basic work and life skills. Second, secondary vocational education plays a foundational role in the modern vocational-education system by providing essential knowledge, technology, and skills education for junior- and senior-high-school graduates and cultivating skilled workers. Medium-level vocational education is the current focus of vocational education. In the future, the overall enrollment scale of general high schools and medium-level vocational schools will remain roughly equivalent.

The third part of the hierarchy is higher vocational education. Building on the success of existing higher vocational (specialized) schools, application-oriented technical universities will be developed to cultivate undergraduate-level vocational talent. Undergraduate-level vocational education represents an emerging trend that emphasizes industry-academia collaboration, interdisciplinary integration, competency-based education, and consistency of certification to enhance students' employability and adaptability within the workforce (Huang, 2025). These application-oriented technical universities are an important component of the higher education system and hold an equal status with other general undergraduate universities.

Transforming the vocational-education school-running model

The vocational-education school-running model represents the structural form and operational mechanisms that vocational education has developed over time (Shi & Hao, 2019). Since the reform and opening-up, to enhance the efficiency and quality of educational operations, the CPC has embarked on transforming the vocational-education school-running model by gradually establishing models of integration of industry and education, such as school-enterprise cooperation. In 1996, the "The law of the People's Republic of China on vocational education" emphasized that "vocational education should serve local economic and social needs, follow the path of industry-education integration, and strengthen school-enterprise cooperation" and legally established these models (Ministry of Education of the People's Republic of China, 2022b).

Since the start of the 21st century, China's vocational education has actively explored industry-education integration and school-enterprise cooperation by focusing on local economic development needs, adhering to the fundamental principles of vocational education. In this way, the vocational-education school-running model has continually evolved. In 2010, the Chinese government mandated the implementation of work-study integration, school-enterprise cooperation, and internship programs to institutionalize school-enterprise cooperation (Ministry of Education of the People's Republic of China, 2010). With a focus on standards and quality, it has continually improved the design of the vocational-education system and promoted project-based development. At the same time, vocational education has actively served local economic and social development, aided in the transformation and upgrading of the economic structure, and optimized the industrial structure, thereby accelerating the modernization of vocational education.

In the process of reforming and advancing the vocational-education school-running model, multiple entities, including the Chinese government, schools, and enterprises, have developed various standardized and institutionalized structural forms and operational mechanisms. Among these, five models are relatively typical and widely practiced: school-enterprise cooperation, group-based education, modern apprenticeship, east-west cooperative education, and Chinese-foreign cooperative education.

The school-enterprise cooperation model

The school-enterprise cooperation model involves collaboration between vocational colleges and enterprises in cultivating a technical-skills orientation. Students are required to learn theoretical and practical knowledge at school and then apply and validate this knowledge while receiving professional-technical skills training at enterprises. Examples include the practices of Hangzhou Vocational and Technical College and Jinhua Vocational and Technical College.

Group-based education

Group-based education is a unique approach within China's vocational-education system that emerged to address the needs for improved resource utilization and efficiency. It relies on vocational-education groups, which are unique alliances of organizations that share the aim of improving vocational education. Under the guidance of group charters, various institutions within the group collaborate to conduct talent cultivation, technology research and development, and skills-training activities. Examples include the group-based education practices in Jiaxing, Zhejiang, and Shanghai, both of which are regionally operated through government-led,

multi-entity collaborations.

Modern apprenticeship

Modern apprenticeship is characterized by alternating school-based and work-based learning guided by institutionalized learning plans and stable mentor-apprentice relationships to form a modern technical-skills training model. Examples include the practices of the Zhejiang Institute of Mechanical and Electrical Engineering and Guiyang Vocational and Technical College.

The east-west cooperative education model

The east-west cooperative education model is a cross-regional education model formed under the guidance of Chinese policy. It aims to promote the balanced development of regional vocational education in China by fully leveraging and utilizing the high-quality vocational-education training resources and employment advantages of the eastern regions and cities to facilitate joint enrollment and cooperative education across regions.

Chinese-foreign cooperative education

Finally, Chinese-foreign cooperative education, as defined by the "Regulations of the People's Republic of China on Chinese-foreign cooperation in running schools", involves foreign educational institutions collaborating with institutions in China to primarily target Chinese citizens for enrollment (State Council of the People's Republic of China, 2005a).

Innovating the vocational-education talent-training model

The vocational-education talent-training model is an actionable talent-standard paradigm that was developed by schools and enterprises based on a shared educational philosophy (Yang & Yu, 2017). It encompasses fundamental elements, such as training objectives, professional settings, and teaching implementation. Since the reform and opening-up, innovation in China's vocational-education talent-training model has primarily concentrated on updating talent-training objectives and reforming the "three teachings": teachers, teaching materials, and teaching methods, which are integral to the entire process of talent cultivation in vocational education (Wang, 2022).

In 1985, China advocated for the vigorous establishment of higher vocational and technical colleges to address the practical need for a large number of "more advanced applied professional and technical personnel" across various regions (China Economic Net, 2007). During this period, China's higher vocational education did not sufficiently emphasize practice and application. Following the promulgation of the "higher education law of the People's Republic of China" in 1998, China's

higher vocational-education system began to focus on cultivating "higher technical application-oriented specialized talents", which referred to students with essential theoretical knowledge and strong practical abilities (State Council of the People's Republic of China, 2018).

In 2006, the "Several opinions of the Ministry of Education on the comprehensive improvement of the quality of higher vocational education teaching" introduced the training objective of "high-quality skilled specialized talents", once again setting the direction for vocational-education talent cultivation. In this way, China increased its emphasis on vocational-education reform and development by requiring vocational education to fully integrate into the larger goal of national rejuvenation (Ministry of Education of the People's Republic of China, 2006). The aim was to cultivate more laborers who are comprehensively developed in terms of their moral, intellectual, physical, and aesthetic abilities as well as high-quality technical skills.

The "three teachings" reform was crucial for helping higher vocational institutions meet the developmental needs of the era and achieve the goal of cultivating high-quality skilled personnel. Tracing the continuity of the "three teachings" reform policy's origins, as early as the 1980s to the 1990s, China initiated practices such as "three teaching coordination", "integration of agriculture, science, and education", and the "spark program" in vocational education.

Since the beginning of the 21st century, China has continued to introduce policies related to the "three teachings" reform to ensure that vocational-education policies are systematically promoted. In 2019, the "Opinions the Ministry of Education and the Ministry of Finance on the implementation of the plan for building high-level higher vocational schools and professional programs with Chinese characteristics" suggested forming high-level, structured teaching innovation teams, deepening the reform of teaching materials and methods, and promoting a classroom revolution (Ministry of Education of the People's Republic of China, 2019). In 2020, the "Action plan for improving quality and excellence in vocational education (2020-2023)" emphasized the need to implement the vocational-education "three teachings" reforms breakthrough action (Ministry of Education of the People's Republic of China, 2020c).

Then, in 2021, the "Opinions on promoting the high-quality development of modern vocational education" established requirements for the coordination and systematic promotion of the "three teachings" reform

policy (State Council of the People's Republic of China, 2021b). First, the reform of vocational-education teachers was required to be strengthened. The "Opinions" highlighted the need to improve the vocational-education teacher-qualification system and to strengthen professional teaching and practice requirements in the national teacher qualification examination. It also called for the development of dual-qualification teacher standards and the improvement of standards for teacher recruitment, professional technical position evaluation, and performance assessment. In particular, professional teachers were required to be equipped according to the student-teacher ratio and the structural requirements of vocational schools.

Second, the "Opinions" called for the reinforcement of the reform of vocational-education teaching materials. The "Opinions" emphasized the need to strengthen national authority over teaching-material production, plan in layers, and improve the mechanisms for the compilation, review, selection, use, updating, evaluation, and supervision of vocational-education teaching materials. Moreover, the "Opinions" called for localities, industries, and schools to be guided to construct local characteristic teaching materials, industry-applicable teaching materials, and school-based professional teaching materials according to regulations (State Council of the People's Republic of China, 2021b).

Third, the "Opinions" called for the strengthening of the reform of teaching methods in vocational education. They emphasized the need to "innovate teaching models and methods" and to "widely implement project-based teaching, situational teaching, and modular teaching, promoting the deep integration of modern information technology with education and teaching to improve classroom teaching quality" (State Council of the People's Republic of China, 2021b).

Reforming the vocational-education examination and enrollment system (1985-1995)

With the attention of the CPC Central Committee and the State Council focused on China's specialized education and the strong support of relevant departments, specialized education began to develop rapidly from the mid-1980s onward. In 1985, China officially launched the reform of the educational system and proposed to "actively develop Higher Vocational Technical Institutions, giving priority to admitting graduates from secondary vocational technical schools and in-service personnel with practical experience in the field and qualified performance" (China Economic Net, 2007). In 1987, the "Notification on the issuance of the provisional regulations on the admission of ordinary higher education institutions" stated that a few

outstanding graduates from secondary vocational-technical schools would be selected to study in ordinary institutions of higher education. The document stipulated that higher-education institutions would admit excellent vocational high-school graduates—1% of the total number of the then-current vocational high-school graduates—using methods such as examinations based on recommendations, recommendations from secondary vocational schools, re-examinations by the admitting schools, and separate examinations (Ministry of Education of the People's Republic of China, 1987). Then, in 1993, the "Outline for China's educational reform and development" called for deepening the reform of the higher-education system, reforming the admission and employment system of higher-education institutions, and changing the previous system of state-assigned admissions and employment (Ministry of Education of the People's Republic of China, 2004). Ultimately, higher-education admissions implemented a combination of national plans and regulatory plans.

Adjusting the higher vocational-education examination and enrollment system (1996-2009)

In 1996, the "The law of the People's Republic of China on vocational education" was enacted, marking the beginning of a new era in the institutionalization of China's vocational education. In 1997, to meet the demand for high-level vocational-education professionals driven by economic development, the "Notification of the State Education Commission on the pilot program for higher vocational education for graduates of secondary vocational schools" was issued. It stated that enrolling fresh graduates from secondary vocational schools was an important part of the general higher-education enrollment plan (State Education Commission, 1997a). The notice also specified the enrollment targets, academic system, enrollment plan, and the examination and admission methods, which combined recommendations from secondary vocational schools with entrance assessments. This policy document was regarded as the prototype of the independent enrollment system for higher vocational colleges and marked the introduction of a genuine policy for the direct advancement of vocational-school graduates.

In 1998, to implement the strategy of invigorating China through science and education, the Ministry of Education formulated the "Plan for the revitalization of education in the 21st century". This plan proposed exploring various examination and enrollment methods to promote the development of higher vocational education. It suggested that most general high-school students should receive higher vocational education and that about 3% of secondary vocational school graduates

should enter higher vocational institutions (Hunan Provincial Department of Education, 2008).

Significantly, in 2002, 2004, and 2005, China held three national vocational-education work conferences, thereby elevating the development of vocational education to a national strategic priority and placing greater emphasis on the proportion of secondary vocational-school graduates admitted to higher-education institutions. During this period, significant emphasis was placed by the state on the quality of higher education, which led to strict control over the enrollment scale of higher vocational education. In 2007, the Ministry of Education initiated pilot programs for independent admissions in exemplary higher vocational colleges in provinces such as Zhejiang, Jiangsu, Guangdong, and Hunan. These reforms achieved notable success and were gradually expanded to exemplary higher vocational institutions nationwide.

The development of the classification examination and enrollment system for higher vocational education (2010-2018)

In 2010, the Ministry of Education of the People's Republic of China proposed the reform of the examination and enrollment system and the gradual implementation of classified entrance examinations for higher-education institutions. This marked the first formal proposal of classified admissions examinations in an official document and signified an important milestone for the independent admissions examinations of vocational colleges, separate from the unified college-entrance examination. The coexistence of diverse examination and admissions methods, such as independent admissions, comprehensive quality evaluation, and targeted admissions, was the main feature of this period.

In 2014, the "Decision of the State Council on accelerating the development of modern vocational education" proposed establishing comprehensive examination and admissions methods, such as "cultural quality + vocational skills" (State Council of the People's Republic of China, 2014a). It aimed to improve diverse growth channels for vocational-education students, provide multiple opportunities for students to receive different levels of higher vocational education, and increase the proportion of vocational colleges enrolling graduates from secondary vocational schools. In the same year, the "Opinions of the State Council on deepening the examination and enrollment system reform" proposed that higher vocational colleges should adopt an evaluation method of "cultural competence + vocational skills" and promoted classified admissions examinations for higher vocational education, which were relatively separate from the admissions examina-

ations of regular colleges and universities (State Council of the People's Republic of China, 2014b). Regular high-school students could enter higher vocational colleges by participating in vocational adaptability tests and cultural quality examinations, while secondary vocational graduates could enter by taking tests that combined cultural fundamentals and vocational skills.

The strengthening of the classified examination and enrollment system for higher vocational education (2019 to present)

In 2019, the State Council issued the "National vocational educational reform implementation plan", which proposed implementing multiple admission methods to meet diverse student needs and further optimize the quality of student intake by improving the vocational-education entrance examination system (State Council of the People's Republic of China, 2019). In 2022, the promulgation of the new version of "The law of the People's Republic of China on vocational education" indicated that the vocational-education entrance examination would be put into practice (Ministry of Education of the People's Republic of China, 2022b). China would increase the proportion of students admitted to vocational undergraduate and vocational colleges through this examination, making it the main channel for admissions to higher vocational education, especially for vocational undergraduate schools. At this stage, the country had already begun the top-level design work to improve the vocational-education entrance examination by focusing on strengthening examination systems and standards, ensuring that examinations were rigorous, orderly, safe, standardized, fair, and just, and optimizing the structure and organization of "cultural competence + vocational skills". Combined, these changes provided multiple admission and learning pathways for students to pursue higher vocational education.

Building a high-quality vocational-education teaching staff

In 1995, the "Notification of the State Education Commission on the construction of demonstration vocational universities" stated that teachers of professional courses and internship instructors need to have certain practical professional abilities, with more than one-third of the teachers required to meet the dual-qualified teacher criteria (State Education Commission, 1995). In 1997, the "Several opinions of the State Education Commission on the establishment of higher vocational schools" stipulated that each major should have at least two full-time teachers with senior professional technical positions and two dual-qualified teachers with intermediate professional technical positions (State Education Commission, 1997b).

Then, in 2019, the "National vocational educational reform implementation plan" set clear goals for strengthening the dual-qualified teaching workforce and aimed for dual-qualified teachers to account for more than half of the total number of professional course teachers by 2022 (State Council of the People's Republic of China, 2019). In 2021, "Beijing's 14th Five-Year Plan for education reform and development (2021-2025)" proposed that the proportion of dual-qualified teachers should reach 82% of professional course teachers. This recommendation followed the Ministry of Education's issuance of the "Basic standards for 'dual-qualified' teachers in vocational education (trial)" and publicly disclosed the local requirements and goals for the vocational-education teaching workforce (The People's Government of Beijing Municipality, 2021).

The competence and training of dual-qualified teachers

The Chinese government has established provisions regarding the concept, competence, and qualities of dual-qualified teachers. First, in terms of competence, dual-qualified teachers need to possess both theoretical and practical teaching abilities as well as relevant operational skills and work experience. In 1998, the "Opinions on the principles for deepening the reform of vocational education and teaching for the 21st century" stipulated that vocational-college teachers should have dual capabilities, namely teaching ability and professional practice ability (Ministry of Education of the People's Republic of China, 1998). Second, in terms of professional titles, dual-qualified teachers need to hold both teaching titles and professional-technical titles, such as engineer—i.e., "dual titles". Third, dual-qualified teachers must possess both a teaching certificate and a vocational skills certificate.

The establishment of dual-qualified teachers' team

Building a high-quality, dual-qualified teacher team is crucial for promoting the development of vocational education. In 2014, the "Opinions of the Ministry of Education on the conduct of pilot programs for modern apprenticeship systems" emphasized the importance of constructing teacher teams in implementing the apprenticeship system (Ministry of Education of the People's Republic of China, 2014b). To stimulate enthusiasm among teachers and staff, schools and enterprises have developed incentive mechanisms that offer promotion opportunities for teachers involved in technical services and enterprise practice and provide teaching allowances to employees participating in school teaching (Ministry of Education of the People's Republic of China, 2014b). In 2022, the "Opinions on deepening the reform of the modern vocational education system" highlighted the strengthening of the dual-qualified teacher team as a key task. It outlined comprehensive and specific

requirements for building dual-qualified teacher teams, including relying on leading enterprises and high-level higher-education institutions to establish several national-level, vocational-education, dual-qualified teacher training bases, developing a vocational-education teacher training curriculum, and conducting customized and personalized training (State Council of the People's Republic of China, 2022).

The evaluation of dual-qualified teachers

Establishing scientific and reasonable evaluation standards for dual-qualified teachers is a crucial step in strengthening dual-qualified teacher teams. The "National vocational educational reform implementation plan", the "Overall plan for deepening the reform of education evaluation in the new era", and the "Basic standards for 'dual-qualified' teachers in vocational education (trial)" all clearly emphasized the importance of improving the evaluation standards for dual-qualified teachers. In 2022, the Ministry of Education issued the "Basic standards for vocational education 'dual-qualified' teachers", which served as the fundamental basis for the cultivation, appointment, and evaluation of vocational-education dual-qualified teachers. These standards primarily target professional teachers, with teacher ethics as the primary criterion. The national standards for vocational-education dual-qualified teachers are based on a multidimensional framework that includes two development levels (secondary vocational and higher vocational), three development standards (primary, intermediate, and advanced), and four general standards (Ministry of Education of the People's Republic of China, 2022c).

Establishing a vocational-education governance system

The vocational-education governance system is composed of an institutional framework that encompasses a comprehensive array of legally established provisions, policy directives, regulatory standards, organizational structures, and operational mechanisms pertaining to vocational education (Zhuang, 2015). The coordination and cooperation among these elements collectively form a governance system for vocational education. With the diversification of stakeholders and the decentralization of power, the construction of China's vocational-education governance system has been characterized by a shift from "management" to "governance".

The decentralized management of vocational education

In 1985, "The decision of the Central Committee of CPC on education system reform" stated that China's educational policy should implement the principles of local responsibility and hierarchical management (China

Economic Net, 2007). That is, it prescribed that the development of vocational education should fully mobilize the enthusiasm of enterprises, institutions, and business departments and encourage collective and other social forces to establish schools. In this way, the decentralized management of Chinese education was established. Since then, China has initiated reforms in the vocational-education management system, including in the schooling, management, and investment systems. It has gradually clarified the management responsibilities of local governments for vocational education and defined the duties of management departments at all levels. Municipal and county governments are also required to earnestly assume the responsibility of developing vocational education and are granted corresponding management authority.

The pluralistic governance system of vocational education

Since the "Decision of the State Council on vigorously promoting the reform and development of vocational education" (State Council of the People's Republic of China, 2002) established an organizational framework for the collaborative promotion of vocational-education development by the government, schools, industries, and enterprises, China's vocational-education governance system has evolved into a pluralistic governance pattern under the macro guidance of the central government. The "National medium- and long-term education reform and development plan (2010-2020)" issued in 2010 proposed actively leveraging the role of industry associations, professional societies, foundations, and other social organizations in the public governance of education (Ministry of Education of the People's Republic of China, 2010).

Moreover, the "Decision of the State Council on accelerating the development of modern vocational education" and the "Plan for the construction of a modern vocational education system (2014-2020)", both promulgated in 2014, hold profound significance for the modernization of China's vocational-education governance system (State Council of the People's Republic of China, 2014a; Ministry of Education of the People's Republic of China, 2014a). They further advanced the transition of national vocational education from government-led administrative management to collaborative governance involving multiple entities, such as industries, enterprises, and social organizations. In 2019, "China educational modernization 2035" clearly emphasized the need to promote the modernization of the education governance system and capacity. Also in 2019, the "Opinions the Ministry of Education and the Ministry of Finance on the implementation of the plan for building high-level higher vocational schools and professional programs with Chinese characteristics"

highlighted the need to enhance school governance levels, improve internal governance systems, and perfect the modern vocational-school system centered around the charter (Ministry of Education of the People's Republic of China, 2019). This involves forming a system for autonomous management and self-regulation in schools, thereby promoting the modernization of governance capacity. It has enhanced the independent governance capacity of enterprises, vocational schools, and industry associations, thereby marking the successful modernization of China's vocational education governance.

Strengthening international cooperation in vocational education

The internationalization of vocational education holds significant value because it can demonstrate the superiority of the socialist system and support the transformation and upgrading of the economic structure. It can also implement the concept of the internationalization of vocational education and promote the modernization of vocational education. Since the reform and opening-up, China's international vocational-education cooperation has gradually deepened and transitioned from primarily receiving project assistance to a dual approach of "going out" and "bringing in" and balancing both scale and quality.

In 2014, the "Decision of the State Council on accelerating the development of modern vocational education" highlighted the need to strengthen international exchange and cooperation, encourage the exchange of teachers and students between Chinese and foreign vocational institutions, implement cooperative education projects, explore and regulate the establishment of vocational institutions abroad, and promote a vocational-education model that aligns with the "going global" strategy of Chinese enterprises and products (State Council of the People's Republic of China, 2014a). Then, in 2020, the "Accelerating and expanding the opening-up of education in the new era" further clarified China's strategic goal to create a more comprehensive, multilevel, and proactive opening-up of the educational landscape (Ministry of Education of the People's Republic of China, 2020a).

In particular, the "Action plan for improving quality and excellence in vocational education (2020-2023)" outlined specific measures to enhance the international influence of vocational education in China (Ministry of Education of the People's Republic of China, 2020c). First, it emphasized strengthening cooperation between vocational schools and overseas Chinese enterprises, supporting the establishment of campuses abroad, cultivating "Luban Workshops", and training local technically skilled workers familiar with traditional

Chinese culture and urgently needed by Chinese enterprises. It encouraged the National Open University to establish overseas learning centers and promote remote education and training cooperation between China and countries with the capacity for cooperation. It also called for the coordinated use of existing resources to implement the "vocational school teachers teaching innovation team overseas training program" and selected a large number of professional leaders and key teachers to study and visit abroad.

Second, the plan aimed to advance the "Chinese + vocational skills" program to assist in the internationalization of Chinese vocational education and enhance its global influence. It guided vocational schools to collaborate with outstanding vocational-education institutions abroad in academic research, the development of standards, and teacher-student exchange projects to promote the overseas introduction of excellent domestic vocational-education achievements. Further, it sought to connect with United Nations Educational, Scientific and Cultural Organization (UNESCO), actively host the World Vocational Education Conference, and organize exhibitions of China's vocational-education achievements in countries within the "Belt and Road" initiative by contributing Chinese wisdom, experience, and solutions to vocational education and showcasing a positive image of contemporary China (Ministry of Education of the People's Republic of China, 2020c).

Advancing the digital transformation of vocational education

The digital transformation of vocational education constitutes a practical and concrete action to promote the high-quality development of modern vocational education. Digitalization is an extension and upgrade of informatization, and vocational-education digitalization evolved from the foundation of informatization. However, the digital transformation of education in developing countries worldwide is hindered by several key challenges: inadequate digital infrastructure, unstable power supply, the high cost of digital devices, and a shortage of digitally competent educators (Niwamanya et al., 2025). In response, the Chinese government has released a series of policy documents focusing on educational informatization and modernization, and the development of "digital China", while implementing a series of reforms to systematically promote the digital transformation of vocational education.

In 2012, the Ministry of Education's "Ten-year development plan for educational informatization (2011-2020)" emphasized the need to vigorously promote the construction of digital campuses in vocational colleges (Ministry of Education of the People's Republic of

China, 2012). The plan aimed to comprehensively enhance the application of informatization in teaching, practical training, scientific research, management, and services, while clarifying the strategic choices and phased key tasks for the informatization of vocational education. In 2016, the "13th Five-Year Plan for educational informatization" identified "accelerating the exploration of digital education resource service supply models and effectively enhancing the service level and capacity of digital education resources" as one of the main tasks (Ministry of Education of the People's Republic of China, 2016). In 2017, the Ministry of Education issued the "Guiding opinions of the Ministry of Education on the further promotion of the development of information technology in vocational education", which called for "extensive publicity and implementation of the 'Standards for the construction of digital campuses in vocational colleges'" and adopting a "government-guided, standard-led, project-demonstrated, and step-by-step implementation approach to promote the construction of digital campuses in vocational colleges" (Ministry of Education of the People's Republic of China, 2017). This was China's first guiding opinion on the informatization work of vocational education. It systematically outlined the direction, requirements, tasks, and assurances for the informatization development of vocational education. In 2018, the Ministry of Education's "Educational informatization 2.0 action plan", the "National vocational educational reform implementation plan", and the 2020 "Action plan for improving quality and excellence in vocational education (2020-2023)" issued by the Ministry of Education and nine other departments all addressed the informatization of vocational education from different perspectives.

Optimizing the allocation of vocational-education resources

The allocation of vocational-education resources refers to how human, material, and financial resources invested by society are distributed across various uses within the vocational-education sector. Resource allocation is crucial in the process of educational modernization. Since 2006, the Ministry of Education has issued a series of policies, such as "Several opinions of the Ministry of Education on the comprehensive improvement of the quality of higher vocational education teaching", the "National medium- and long-term education reform and development plan (2010-2020)" (Ministry of Education of the People's Republic of China, 2010), the "Decision of the State Council on accelerating the development of modern vocational education" (State Council of the People's Republic of China, 2014a), the "National vocational educational reform implementation plan" (State Council of the People's Republic of China, 2019), and the "Action plan for improving quality and

excellence in vocational education (2020-2023)" (Ministry of Education of the People's Republic of China, 2020c), which all made specific provisions for enhancing the financial support for vocational education.

On a practical level, financial departments at all levels nationwide prioritize vocational education as a key investment area and consistently direct educational funds toward vocational education. During the "13th Five-Year Plan" period, China invested a total of 2.4 trillion yuan in vocational education, with an average annual growth of 7.8%. Of this investment, fiscal vocational-education funds reached 1.84 trillion yuan, with an average annual growth of 8.6%. The proportion of fiscal vocational-education funds in the total vocational-education funds has increased year by year. At the same time, the per-student funding for vocational education continues to increase, and all provinces in China have established per-student funding systems for both secondary and higher vocational education.

At the end of the "13th Five-Year Plan" period, the national average financial allocation for secondary and higher vocational students reached approximately 16,000 yuan. The national scholarship policy supported over 5.8 million students in secondary and higher vocational institutions, with financial funding close to 11.9 billion yuan, by focusing on assisting students from 11 contiguous poverty-stricken areas and students from registered impoverished households. Likewise, social forces organize and participate in organizing vocational education. Similarly, China promotes state-owned enterprises and private capital as important forces in participating in and organizing vocational education. Nationwide, state-owned enterprises run 435 vocational-education institutions, including 197 central enterprises and 238 local state-owned enterprises. There are 337 private higher vocational schools with 3.23 million students enrolled, and private secondary vocational schools have an enrollment of 2.49 million students. China also actively explores the implementation of vocational-education shareholding and mixed-ownership reform pilots. Finally, China implements exemplary project construction. Since 2006, the Chinese government has cumulatively invested over 500 billion yuan in implementing major projects. These projects supported the construction of 199 national demonstrative (key) higher vocational schools, 1000 national secondary vocational educational reform development demonstration schools, 197 schools under the "China-characteristic high-level higher vocational schools and specialty construction plan", and over 3000 training bases, thereby significantly improving the conditions of vocational schools and leading China's intensive vocational-education development (Ministry of Education of the People's Republic of China, 2022a).

MAJOR ACHIEVEMENTS OF CHINA'S VOCATIONAL EDUCATION REFORM

Supporting high-quality economic development

To provide a continuous talent dividend for the industrial economy, China's vocational education actively adapts to economic structural adjustments and industrial transformations while closely monitoring industrial chain lines, market signals, technological frontiers, and people's livelihood needs. Currently, the state has established over 1300 specialties and more than 120,000 specialty points covering all fields of the national economy. Over the past decade, vocational schools have cumulatively trained and delivered 61 million high-quality and technically skilled workers to various industries. In fields such as the modern manufacturing industry, strategic emerging industries, and the modern service industry, over 70% of newly added front-line employees are graduates from vocational schools. This provides foundational support and active forces for promoting the release and realization of China's demographic dividend, transforming advanced technologies and equipment into real productivity, and maintaining the strong resilience and steady progress of China's industrial chain and supply chain (Ministry of Education of the People's Republic of China, 2022a).

Providing power for accelerating the digital economy

As the impact of the coronavirus disease 2019 (COVID-19) pandemic and the global digitalization trend on the economic and social aspects of countries intensifies, a major issue facing the vocational-education sector worldwide is how to jointly promote the high-quality development of global vocational education and contribute to building a better post-pandemic world. It is both timely and necessary to rely on digitalization to reshape the new ecology of vocational education, empower its new development, and form a new paradigm of vocational education growth (Ping, 2022). Therefore, cultivating digital technology talent is key to reshaping the new ecology of vocational education and transforming its development. China, through diversified forms of cooperation, is cultivating application-oriented, skilled, and compound digital-technology talent, enhancing the digital-thinking ability and digital-governance competence of management personnel at all levels, and strengthening the capability of vocational education to serve the digital economy.

Providing "green skills" transformation services for the ecological economy

The report of the 20th National Congress of the CPC pointed out that the Chinese path to modernization is characterized by harmonious coexistence between

humans and nature and that the green transformation of development modes should be accelerated to promote the formation of green production and lifestyles (Xi, 2022). As such, the development of "green vocational education" is an inevitable step for the vocational-education sector to assist China in its path to modernization (P. Zhang, 2022). The cultivation of green technical skills is the core pathway for implementing green vocational education.

In general, green vocational education encompasses training for green vocational qualification certificates, enhancing vocational students' green competencies, and acquiring green skills. This reflects the strong connection between the cultivation of green skilled personnel in vocational education and green industries (Xie & Sun, 2017). China is accelerating low-carbon initiatives across various fields to foster the ecological development of the entire industrial chain. Likewise, vocational education is actively involved in developing green skills by establishing majors in green low-carbon technology and intelligent environmental protection equipment technology, thereby expanding the supply of green low-carbon technically skilled workers. For this reason, the concept of green low-carbon environmental protection is integrated into the vocational-education teaching standard system. At the same time, green skills are incorporated into the national vocational college skills competition content, and green elements and concepts are embedded into all aspects and processes of vocational-school classroom teaching.

Promoting coordinated social development

To provide pathways for diversified human development, China has established an open, inclusive, and integrated broad educational perspective, thereby creating a modern vocational-education system that meets the needs of diversified development, and serves lifelong learning for all. This system provides diverse choices and multiple pathways for success for students with different personalities, interests, talents, potential, and who are at different stages of learning. These options enable more students to acquire skills for employment, access channels for further education, and find pathways for development.

For example, in the integration of vocational and general education, national policies have driven various regions and schools to launch pilot projects. The educational reform development experimental zone in Guang'an, Sichuan, was the first to begin national pilot exploration in 2012. Regions such as Beijing, Tianjin, Shandong, Jiangsu, Zhejiang, and Sichuan have successfully introduced relevant policies to promote the reform of the integrated-education model of vocational and general education.

In terms of form, the integration of vocational and general education is roughly divided into three types: first, integration at the basic education stage, which mostly explores the development model of comprehensive high schools, second, the integration of secondary and higher education, and third, integration at the higher education stage, which is achieved through joint programs between higher vocational colleges and regular undergraduate institutions (Zeng, 2023). In addition, approximately 300,000 retired military personnel, laid-off workers awaiting employment, migrant workers, and new-type professional farmers receive higher vocational education in China each year. China has consecutively held several national vocational-college skills competitions, aiming to provide vocational-school students with opportunities and platforms to showcase their skills and realize their life goals.

Establishing a pathway to high-quality employment

China's vocational education is committed to being market-oriented, development-serving, and employment-promoting. It aligns closely with industrial development by continually enhancing the adaptability of talent cultivation to meet job requirements. The employment rate of vocational-school graduates has consistently remained high, with secondary and higher vocational graduates achieving employment rates exceeding 95% and 90%, respectively, and the rate of employment in fields related to their majors remaining stable at over 70%. In 2020, the Ministry of Education of the People's Republic of China held the annual promotion meeting titled "promote the spirit of progress and complete the final tasks" to highlight that vocational education focuses on serving high-quality development and promoting high-level employment.

The level of students' technical skills and the quality of their employment are key indicators of the quality of talent cultivation in vocational colleges (Ministry of Education of the People's Republic of China, 2020b). In 2021, the General Office of the Central Committee of the CPC and the General Office of the State Council issued the "Opinions on promoting the high-quality development of modern vocational education", which emphasized the cultivation of more high-quality technically skilled workers, skilled craftsmen, and national-level master artisans to provide strong talent and skill support for the comprehensive construction of a modern socialist country (State Council of the People's Republic of China, 2021b). Vocational colleges aim to shift from merely increasing the number of graduates employed to improving the quality of employment by cultivating more high-quality, technically skilled workers. This approach supports graduates in achieving quality employment and contributes to the joint development of

society, the economy, and individual workers, thereby making higher vocational education with Chinese characteristics in the new era a type-based education that satisfies the needs of the public (Hu *et al.*, 2022).

Employment positions for graduates of Chinese vocational schools are distributed across high-end industry and the upper echelons of industry. The annual income of higher vocational graduates six months after graduation significantly exceeds the average per capita disposable income of urban and rural residents. Research indicates that Chinese vocational education can promote the growth of residents' wages, with each unit increase in vocational education leading to a 5.49 percentage-point increase in wage-based income (Feng *et al.*, 2022).

Providing a pathway to narrow the wealth gap

Vocational education, as an education type most closely linked with the development of agriculture, rural areas, and farmers, plays an important role in enhancing the level of human capital in rural areas. It has great potential for promoting comprehensive rural revitalization and plays a key role in narrowing the urban-rural wealth gap in China. The role of Chinese vocational education in the rural revitalization strategy has evolved from "political recognition" to "economic service" and then to "cultural symbiosis", with a shift in talent cultivation from "political awareness type" to "technical skills type" and then to "innovation and entrepreneurship type" (Peng & Zhu, 2022).

The Chinese government is vigorously developing vocational education aimed at agriculture and rural areas by constructing a high-quality resource system for rural vocational education and training. Fifteen percent of higher vocational colleges conduct training for new-type professional farmers, exceeding 5000 people per day annually, thereby cultivating a large number of "soil experts", "field scholars", "rural entrepreneurs", and "prosperity leaders". This effort lays a human-resource foundation for effectively serving the construction of a modern rural industrial system.

Over 70% of vocational-school students come from rural areas. These students have become a driving force in poverty alleviation and rural revitalization, significantly contributing to the advancement of new urbanization processes. From 2013 to the end of 2020, more than eight million students from impoverished families received vocational education. Graduates of vocational schools have become an important source for rural revitalization and the expansion of the middle-income group (Ministry of Education of the People's Republic of China, 2022a).

Contributing to the high-quality education system

With the continuous deepening of the technological revolution and industrial transformation, countries worldwide are placing unprecedented emphasis on the coordinated layout of the entire industrial chain, thereby increasing the collaborative cultivation of research, engineering, and technical talent as well as skilled personnel. In recent years, China has regarded vocational education as an important breakthrough in optimizing the educational structure and comprehensive educational reform by focusing on improving the quality of vocational education and enhancing its adaptability. As a result, China's vocational education is advancing in both scale and quality, maintaining a significant position in the Chinese education system, and dynamically adapting to the changes in the new economy, new technologies, new forms of business, and new professions.

China's vocational-education system optimizes its structure through both "vertical" and "horizontal" integration. The "vertical" integration mainly refers to China's vocational education college entrance examination system, which is based on the characteristics of vocational education. It enhances the distinctive features of vocational education, selects technical skills-oriented students for national development, cultivates technical skills-oriented students to serve regional economies, and provides a technical skills pathway for individuals' comprehensive development. The "horizontal" integration mainly refers to the integration of vocational and general education, meaning the mutual integration and development of vocational education and general education, with compulsory education as the foundation, high-school education as the focus, and higher education as the forefront (Zeng, 2020). China adheres to the parallel development of general education and vocational education by balancing academic and skills education and cultivating workers with diversified talents.

Promoting educational equity

In a knowledge- and skill-based society, education is both an inherent component of prosperity and a key force in promoting it. China consistently adheres to a people-centered development philosophy that considers vocational education an important component of balanced development in quality education. Thus, the nation strives to ensure that over 1.4 billion people have access to fair and quality education. China's vocational education is characterized by its large scale, wide coverage, diverse levels and types, and closer proximity to socially disadvantaged groups (Y. Q. Zhang, 2022). It serves as a fundamental basis for cultivating technically skills-oriented workers and promoting employment and

entrepreneurship for wealth creation, with strong relevance to enhancing the wealth-creation capabilities of the entire population.

To ensure that everyone has the opportunity to receive vocational education, the Chinese government has established a financial-aid system that includes exemptions, subsidies, assistance, scholarships, and loans. Tuition exemptions and scholarships for secondary vocational education cover more than 90% and 40% of students, respectively, while scholarships and grants for higher vocational education cover nearly 30% and 25% of students, respectively. The student-aid policy for vocational education significantly contributes to ensuring educational equity, thereby enhancing the appeal of vocational education and improving the quality of vocational-education institutions. Additionally, vocational education offers various forms of education and skills training for disadvantaged groups, such as people with disabilities and those facing financial difficulties. Thus, it plays an important role in promoting the coordinated development of vocational education alongside general education, special education, and continuing education.

Enhancing international exchange and cooperation

Vocational education accompanies Chinese enterprises and products as they "going out" and supports the "Belt and Road" initiative by establishing stable connections with over 70 countries and international organizations. It has cooperated with 19 countries and regions to build 20 Luban Workshops, and, in over 40 countries and regions, it has launched "Chinese + vocational education" special projects. These efforts have cultivated a large number of local, technically skilled workers who understand Chinese, are familiar with traditional Chinese culture, and are urgently needed by local Chinese-funded enterprises. Many Chinese vocational-school teachers have traveled across the ocean to impart vocational skills and experience to local youth. In this way, they help countries along the "Belt and Road" cultivate technical skills in their workers and assist in the industrialization of partner countries. For example, the Nanjing Vocational Institute of Railway Technology has taken the lead in establishing international cooperation platforms, such as the "China-ASEAN rail transit education and training alliance". It recruits and trains international students from countries along the "Belt and Road" through order-based methods and has set up overseas railway training bases in Egypt and Laos.

Promoting technological and cultural exchanges

China actively participates in the world skills competition, strengthens connections and communi-

cation with countries around the world, jointly addresses the difficulties and challenges faced by the world, and contributes Chinese solutions, wisdom, and strength to the building of a community with a shared future (Zeng *et al.*, 2022). Since officially joining the WorldSkills International in 2010, China has won a total of 36 gold medals, 29 silver medals, and 20 bronze medals in the past five WorldSkills competitions, with the number of participating projects and the scale of participation continually expanding.

Additionally, China is focusing on the European region to build a Sino-European "dual system" integration of industry and education platforms. Its purpose is to strengthen vocational-education cooperation with quality enterprises in relevant industries in Germany, France, Switzerland, and other European countries. The establishment of the "industry-education alliance of vocational colleges in China and Central and Eastern European countries" is also being promoted, along with the development of a school-enterprise cooperation platform with Central and Eastern European countries.

For the African region, the "Future Africa and China-Africa vocational education cooperation plan" has been initiated, and the "China-Africa vocational education cooperation association" has been established to further strengthen ties and exchanges with vocational schools in African countries. In the Southeast Asian region, the "China-ASEAN dual hundred vocational schools flagship cooperation plan" is being implemented, with 80 pairs of distinctive cooperation projects already selected among vocational schools in China and ASEAN countries. In 2022, China hosted the Conference of Brazil, Russia, India, China, and South Africa (BRICS) Vocational Education Alliance, established the BRICS Vocational Education Alliance, and successfully organized the BRICS vocational skills competition, which positively impacted the promotion of exchanges and dialogue in the vocational-education field among BRICS countries.

Cultivating cultural-exchange ambassadors

Talented workers are a primary resource, and international talent has become a strategic resource for enhancing national strength and international competitiveness. With the intensification of globalization and the formation of the "global village", international talent will lead the development of the era (Xin & Ni, 2016). The internationalization of vocational education has consistently been regarded as one of the important ways to closer People-to-People ties under the "Belt and Road" initiative. One of the core missions of vocational schools for international students in the new era is to cultivate ambassadors of closer people-to-people ties. In recent years, especially in developed regions where vocational education is relatively mature, Chinese

vocational colleges have played a significant role in admitting international students and promoting student mobility. International students in these vocational colleges in China have shown noticeable improvements in their intercultural competence at the emotional, cognitive, behavioral, and moral levels (Chen *et al.*, 2024).

CONCLUSION

The era of globalization is characterized by complexity, variability, and uncertainty, as well as profound global interconnectedness and interdependence. It brings both unprecedented opportunities and immense challenges. Globalization is a dynamic process, vibrant yet fraught with tension, profoundly reshaping every aspect of the world.

The wave of globalization has profoundly reshaped the global industrial landscape and talent demands, while a new round of scientific and technological revolution and industrial transformation has imposed new requirements for skilled talent development. Vocational education in the era of globalization fundamentally aims to cultivate high-quality technical and vocational professionals with global competence. Its teaching content aligns with international cutting-edge practices and standards, its teaching models are embracing open collaboration and digitalization, its faculty is becoming increasingly professionalized, its quality evaluation seeks international recognition, and its services extend to the global market. This dynamic and evolving process demands a vocational education system with a high degree of openness, adaptability, and foresight. Vocational education tailored to the demands of the globalization era not only enhances individual career competitiveness but also provides robust support in skilled technical talent for national engagement in global competition and cooperation.

To better summarize, distill, and disseminate the experiences and knowledge gained from China's vocational education reform in the era of globalization, this article undertook a systematic and in-depth examination of these reforms. In the era of globalization, China's vocational education is undergoing a period of transformation and upgrading, shifting its focus from quantitative expansion to qualitative improvement. It is tasked with both meeting the intrinsic demands of national industrial upgrading and high-quality economic development, and responding to the external environment of global competition and cooperation. Consequently, its reforms and development showcase distinct Chinese characteristics alongside a global perspective. China's vocational education in the era of globalization is accelerating the development of a modern system that combines Chinese characteristics with world-class standards, anchored by national strategy, powered by industry-education integration, and

bridged by international cooperation.

Its goal is to establish China as a strong vocational education nation by 2035, providing robust support for achieving Chinese modernization. Its core mission is twofold: to solidify the talent base for China's transformation from a manufacturing giant into a manufacturing and innovation powerhouse, and to provide skilled support for global sustainable development. In the era of globalization, China's vocational education serves not only as a vital force for cultivating technical and skilled talents but also as a crucial driver of the development and transformation of global vocational education.

China's vocational education reforms in the era of globalization are not only dedicated to overcoming the domestic bottleneck of insufficient high-quality technical and skilled talent supply. They also actively engage in global vocational education governance through knowledge production, standard dissemination, model sharing, and talent exchange, thereby assisting in solving global development challenges and contributing irreplaceable Chinese strength to building a community of human skills development.

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