Sustainable Management Review

Current Issue:Vol 1, No 3 (2026)
DOI: doi.org/10.70693/smr.v1i3.17
Received Date April 5, 2026
Accepted Date May 12, 2026

PAPER

Research on the Sustainable Development of Economic and Management of Vocational Education in China in the Digital Age

Chen Qin[1],veronika Garkavaya[1]

1 International Institute of Management and Business, 220086, Minsk

Abstract

Against the backdrop of the profound penetration of the digital wave into all walks of life, vocational education, as the core position for cultivating skilled talents and supporting industrial upgrading, is facing profound changes in its economic investment and management models. This paper, based on the characteristics of the digital age and combining the core connotations of vocational education economics and management, systematically reviews the policy, economic, technological, and practical foundations for the digital development of vocational education in China. It analyzes the current status and characteristics of development from both economic and management dimensions, deeply explores the prominent problems and external challenges currently faced, draws on advanced international practices, proposes targeted development paths, and ultimately forms research conclusions and future prospects. This research aims to enrich the theoretical connotation of the interdisciplinary field of vocational education economics and management, provide practical references for the high-quality digital development of vocational education in China, and contribute to the construction of a skills-based society and the cultivation of new productive forces.

Key words: Digitalization, vocational education, education

Introduction

Currently, digitalization has become a core engine driving high-quality economic and social development. Its penetration into the education sector is expanding in both breadth and depth, reshaping teaching models, management mechanisms, and the development ecosystem. Vocational education, as a key vehicle connecting education and industry and cultivating frontline skilled personnel, shoulders the important mission of providing talent support for digital transformation. Faced with the dual demands of industrial digitalization and the digitalization of industries, the traditional economic investment model and management system of vocational education are no longer suitable for the new development situation. Digital transformation is urgently needed to overcome development bottlenecks and improve development quality. Against this backdrop, focusing on the economic and management issues of vocational education in China in the digital age and conducting systematic research has significant theoretical and practical implications. Theoretically, it can enrich the research content of the cross-integration of vocational education with economics and management, fill the research gap on economic investment and management reform in vocational education under the digital background, and improve the theoretical system for the modernization of vocational education. Practically, it can accurately grasp the economic laws and management logic of the digital development of vocational education, providing operable paths for governments to optimize vocational education investment, for schools to improve management efficiency, and for enterprises to deeply participate in industry-education integration, promoting the resonance between vocational education and industrial digitalization and contributing to the high-quality development of vocational education in my country.

Literature Review

Definition of Core Concepts

Digital era: With big data, artificial intelligence, blockchain, virtual simulation and other digital technologies as the core support, data resources as the key production factor, and digital transformation as the main line of development, it presents the core characteristics of accelerated technological iteration, data interconnection, deepening of business integration and precise and efficient services. Its essence is to reconstruct production, life and governance models through digital technology, and have a comprehensive and profound impact on the development of various fields [5] .

Vocational Education Economics and Management: It is an interdisciplinary subject that integrates vocational education, economics and management. Its core connotation is to systematically plan, organize, coordinate and control economic and management activities such as funding, resource allocation, industry-education integration and quality governance in the field of vocational education, in line with the talent training goals of vocational education. Its research boundaries cover multiple subjects such as government, colleges and universities, enterprises and society, focusing on the efficiency and effectiveness of economic investment, the optimization and innovation of management models, and ultimately achieving the rational allocation and high-quality development of vocational education resources [3] .

Current Status of Research at Home and Abroad

Foreign countries have a long history of research on digital empowerment of vocational education economics and management, and have formed

relatively mature practical experience and theoretical achievements. Developed countries such as Europe, the United States and Japan focus on the deep integration of digitalization and vocational education, and focus on the path and model of digital empowerment of vocational education governance and industry-education integration. For example, the digital transformation of Germany's "dual system" vocational education model emphasizes the deep participation of enterprises in vocational education digital investment and management, and improves the pertinence of talent training through virtual training, digital courses and other means [7] . The United States focuses on the sharing of digital resources in community colleges, builds a diversified funding investment model, promotes the integration of teaching resources across regions and colleges, and reduces the operating costs of vocational education. Japan focuses on the training of digital teachers in vocational education, establishes a collaborative governance mechanism between the government and enterprises, and ensures the orderly advancement of the digital transformation of vocational education. In general, foreign research focuses on the innovation of models at the practical level, focuses on the collaboration of multiple subjects and the effectiveness of technology application, and provides useful reference for China [4] .

Domestic research has developed rapidly in recent years with the advancement of China's digital strategy for vocational education. Scholars have conducted a lot of research on the transformation of vocational education economic investment and management model under the digital background. In terms of economic investment, the research mainly focuses on the optimization of government financial investment and the participation mechanism of enterprises and social capital, and explores the scale, structure and benefits of digital investment. In terms of management model, the research focuses on the empowering role of digitalization in vocational education governance, resource allocation and quality evaluation, and proposes a data-driven governance model and a multi-cooperative management path. However, existing research still has shortcomings: First, the research on the digital integration of vocational education economy and management is not in-depth enough, and it focuses on single-dimensional analysis and lacks systematic integration of economic and management dimensions. Second, the research focuses on macro-level policies and models, and is not specific enough on micro-level college practices and cost-benefit analysis. Third, the research on the regional differences and talent shortage faced in digital transformation is not in-depth enough, and the targeted solutions are not perfect enough, and further in-depth research is still needed [9] .

2. The Economic and Management Foundation for the Development of Vocational Education in China in the Digital Age

Policy Support: Top-Level Design Guides Digital Transformation

In recent years, China has successively issued a series of policy documents to build a top-level design system for the digital development of vocational education. In 2022, the "Opinions on Promoting the High-Quality Development of Modern Vocational Education" clearly proposed to promote the digital transformation of vocational education, build a smart education platform for vocational education, and promote the co-construction and sharing of virtual simulation training resources. In 2023, the "Opinions on Digital Education" further refined the requirements, clarified the development goals, key tasks and guarantee measures for digital vocational education, and promoted the deep integration of digital technology with vocational education teaching, management and services. In addition, various regions have also issued supporting policies, combined with the characteristics of regional industries, to promote the pilot projects of digital vocational education and form a policy pattern of linkage between the top and bottom [8] . At present, China's digital vocational education policy presents four major orientations: first, data-driven governance, promoting the integration and sharing of vocational education data resources, and improving the accuracy and efficiency of governance; second, diversified investment orientation, encouraging government, enterprises and social capital to invest in collaboration and broaden the funding channels for digital vocational education; third, industry-education integration digitalization, promoting enterprises to participate in the construction of digital vocational education and realizing the real-time connection between industry needs and talent training; and fourth, quality improvement orientation, using digitalization to empower teaching reform and quality evaluation, and improve the quality of vocational education talent training [6] .

Economic Foundation: Continued Increase in Digital Investment

Overall Funding Scale and Structure (Government, Enterprise, and Social Capital Proportions): With the advancement of the digitalization strategy for vocational education, China's vocational education funding has continued to grow, forming a diversified investment structure led by the government, with enterprise participation and social supplementation. Government fiscal investment accounts for the largest share, approximately 65%-70% of the total investment, primarily used for the construction of smart platforms for vocational education, the development of virtual training bases, and digital teacher training. Enterprise investment accounts for approximately 20%-25%, mainly through employee education funds, joint construction of training bases between schools and enterprises, and digital order-based training. Social capital investment accounts for approximately 5%-10%, supplemented through PPP models, donations, and revenue from digital training services, providing stable financial support for the digital development of vocational education. Furthermore, special investments in digitalization focus on three major areas: smart platforms, virtual training, and digital campuses, with continuous increases in these investments. The National Vocational Education Smart Platform has integrated a massive amount of online courses and virtual training resources, with a cumulative investment of over 5 billion yuan; various regions have accelerated the construction of virtual training bases. By the end of 2024, vocational colleges across the country had built over 1,200 virtual training bases, with a special investment of over 30 billion yuan; the construction of digital campuses has been fully promoted, and the vast majority of vocational colleges have achieved digital coverage of teaching, management, and services. The investment in digital campus construction has increased by an average of over 15% annually [2], see Figure 1 for details .

Technical Support: Deep Integration of Digital Technology and Vocational Education

China has adopted digital technologies such as virtual simulation training, AI teaching, big data analysis, and blockchain traceability in the field of vocational education. Virtual simulation training replaces some high-risk and high-cost physical training, reducing training risks and costs. It has now covered multiple majors such as machinery, nursing, and new energy. AI teaching realizes personalized teaching push, learning situation analysis and intelligent Q&A, improving teaching efficiency. Big data analysis is used for industry demand prediction, professional setting optimization and student employment guidance, realizing precise matching of talent training and industry demand. Blockchain technology is used for the traceability management of student status and skills certification, ensuring the authenticity and authority of certification. At the same time, the National Vocational Education Smart Platform has been built and put into use, realizing the integration and sharing of vocational education resources nationwide, with a cumulative registered user of over 100 million. The regional digital vocational education system has been gradually improved. The developed eastern region has formed a two-level architecture of "provincial smart platform + college digital system". The central and western regions are accelerating the filling of infrastructure gaps and promoting the balanced development of vocational education digital infrastructure. 5G, Internet of Things and other technologies are widely used in vocational colleges, providing high-speed and stable technical support for digital teaching and training [1]. The relevant functional architecture diagram is shown in Figure 2 .

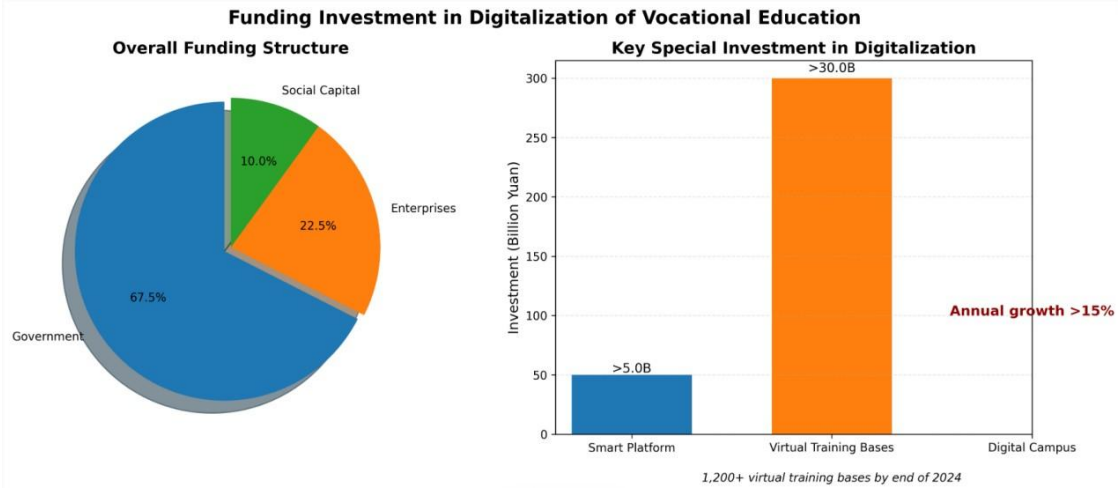

Fig. 1. Comparison ofDigital Strategies in Digital Vocational Education

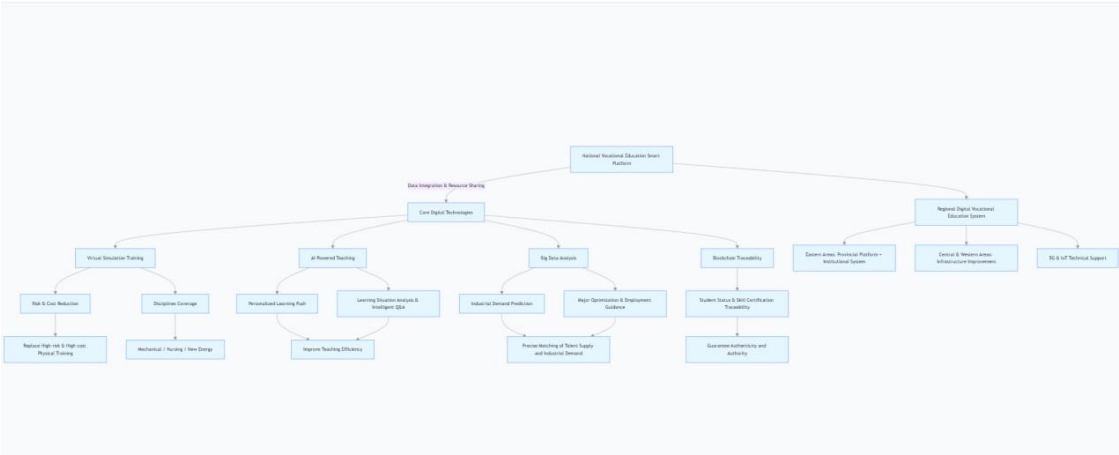

Fig. 2. Technical Support for Vocational Education in China : A Diagram ofDeep Integration of Digital Technology and Vocational Education

Practical Foundation: Achievements of the Digital Pilot Project for Industry-Education Integration

Digital Practices of Municipal Industry-Education Consortia and Industry-Education Integration Communities: Numerous municipal industry-education consortia and industry-education integration communities have been established nationwide, achieving resource sharing and collaborative cooperation among schools, enterprises, and industries through digital platforms. For example, the Yangtze River Delta municipal industry-education consortium has built a digital collaborative platform to achieve cross-regional course sharing, joint construction of practical training resources, and joint talent training programs; the new energy vehicle industry-education integration community has developed digital practical training courses, promoting the alignment of enterprise technical standards with school teaching content. There are also cases of digital management and teaching reform in vocational schools (such as the construction of virtual training bases): Vocational schools across the country are actively promoting digital teaching and management reforms, forming a number of typical cases. For example, a vocational school built a smart manufacturing virtual training base, simulating production scenarios through virtual simulation technology to achieve "theory-practice integration" teaching, increasing student training efficiency by more than 40%; another vocational school built a digital management platform to achieve full-process digital management of student records, teaching, finance, and employment, increasing operational efficiency by 30% and reducing management costs by 25%.

3. The Current Status and Characteristics of the Economic Dimension of Vocational Education in China in the Digital Age

Funding Input: From Single Supply to Multi-faceted Collaboration

In the digital age, my country's vocational education funding has broken away from the traditional single-government supply model, forming a new pattern of collaborative investment among the government, enterprises, and social capital. At the government level, there has been a continuous increase in fiscal allocations, with a focus on digitalization and practical training, and a steady rise in per-student funding. In 2024, the per-student special allocation for digitalization in vocational schools nationwide increased by more than 50% compared to 2021, with a focus on supporting the digitalization of vocational schools in the central and western regions and rural areas. At the enterprise level, there is active participation in vocational education digitalization investment, increasing investment through methods such as allocating employee education funds, jointly building training bases with schools, and digital order-based training. Some large enterprises invest over ten million yuan annually in vocational education digitalization. At the social capital level, there is participation in vocational education digitalization through PPP models, donations, and digital training services, becoming an

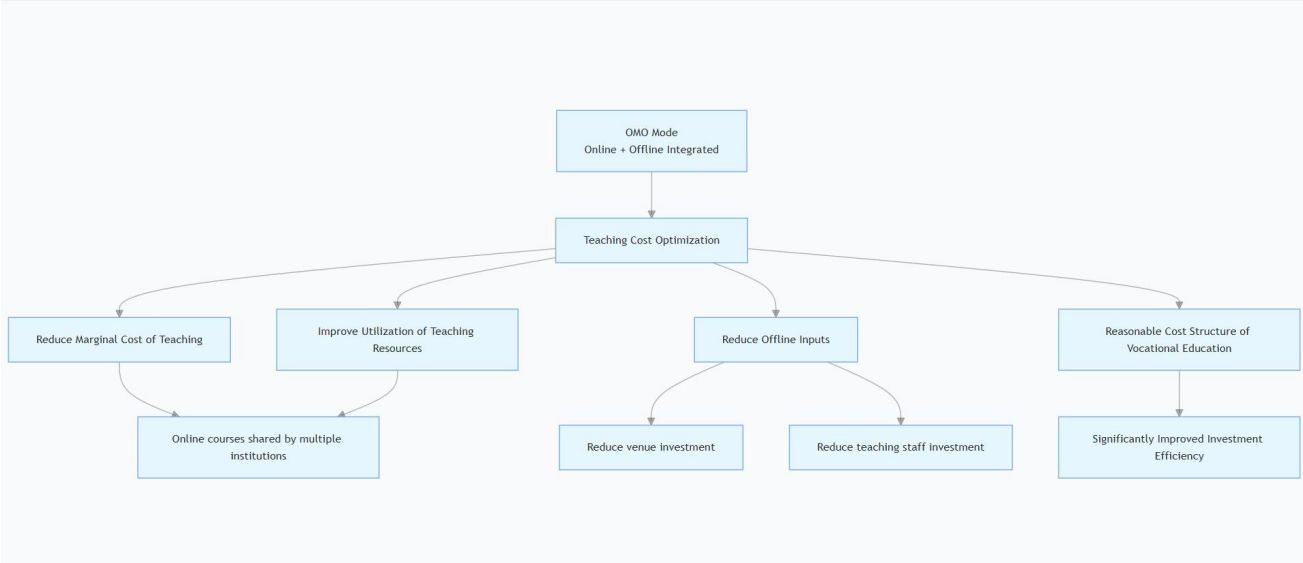

Fig. 3. OMO schematic diagram

important supplement to funding. This diversified and collaborative investment model has effectively broadened the funding channels for vocational education digitalization, providing stable financial support for digital transformation. However, it also presents problems such as uneven regional investment and insufficient enthusiasm among enterprises.

Cost Structure: Digitalization Enables Cost Reduction and Efficiency Improvement

Traditional vocational education suffers from significant drawbacks, including high costs for training equipment, facilities, and teacher development. Digital transformation effectively optimizes the cost structure, achieving cost reduction and efficiency improvement. Regarding training costs, virtual training replaces some physical training, significantly reducing the costs of equipment procurement, maintenance, and facility rental. For example, the investment in virtual training equipment for a certain mechanical engineering major is only 30% of that for physical training equipment, and it is reusable, saving over 50% in maintenance costs annually. In terms of resource allocation costs, digital resource sharing reduces redundant construction. The resource sharing of the National Vocational Education Smart Platform eliminates the need for schools across regions to repeatedly develop courses and build training resources, resulting in cumulative savings of over 20 billion yuan in construction costs. Regarding teaching costs, the OMO (Online-Merge-Offline) model reduces the marginal cost of teaching. Online courses can be shared by multiple schools, effectively improving the utilization rate of teaching resources while reducing the investment in facilities and teachers for offline teaching, further lowering teaching costs. Overall, digital transformation makes the cost structure of vocational education more rational and significantly improves investment efficiency . An OMO diagram is shown in Figure 3 .

Economic Benefits: A Positive Interaction Between Talent Supply and Industrial Upgrading

In the digital age, the economic benefits of vocational education are becoming increasingly prominent, forming a virtuous cycle of talent supply and industrial upgrading. Regarding talent matching, big data analysis accurately grasps industry needs, optimizing professional settings and talent training programs, significantly improving the fit between vocational education talent training and industry demands. In 2024, the job matching rate for graduates of digital-related majors in vocational colleges nationwide reached over 85%, an increase of 15 percentage points compared to 2021. In terms of employment quality, there is a shortage of digitally skilled personnel, with significant advantages in both salary levels and employment rates. Statistics show that the employment rate for graduates of digitally related majors is over 98%, and their average salary is more than 20% higher than that of graduates from traditional majors. Regarding industry support, vocational colleges leverage digital technologies to provide enterprises with technical services,成果转化(technology transfer), and employee training, assisting enterprises in their digital transformation. In 2023, vocational colleges nationwide provided digital technology services to enterprises over 100,000 times, with technology transfer exceeding 5 billion yuan, effectively contributing to the development of new productive forces and achieving mutual empowerment between vocational education and industrial development.

Regional Differences: Inter-provincial and Urban-Rural Gap in Digitalization Investment and Benefits

Due to factors such as economic development level and policy support, the investment and benefits of digitalization in vocational education in China exhibit significant regional disparities. Regarding inter-provincial differences, the developed eastern regions, with their strong economies, invest heavily in digitalization in vocational education. In 2024, the per capita investment in digitalization in vocational schools in the eastern region was more than 2.5 times that of the central and western regions. These regions also boast well-developed digital infrastructure, widespread technology application, and significant economic benefits. Conversely, the central and western regions, with their weaker economic foundations, have insufficient investment in digitalization, relatively lagging infrastructure, and less in-depth technology application. Their talent cultivation is less aligned with industry needs than that of the eastern regions. Regarding urban-rural differences, urban vocational schools, leveraging their locational advantages, can attract more government investment, corporate cooperation, and social capital, resulting in higher levels of digitalization in construction, management, and teaching. Rural vocational schools, facing funding shortages, weak faculty, and inadequate digital infrastructure, have limited application of technologies such as virtual training and AI teaching. Their digital transformation progresses slowly, and the gap between them and urban vocational schools is widening, hindering the balanced development of vocational education.

4. The Current Status and Transformation of Vocational Education Management in China in the Digital Age

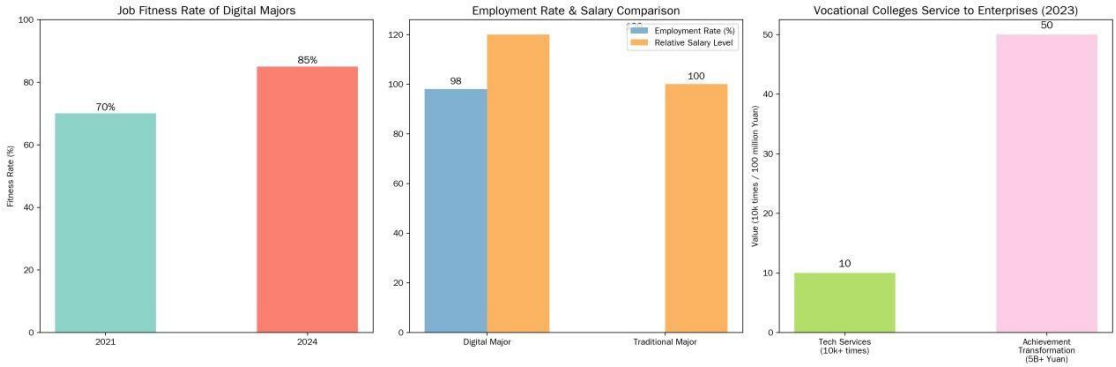

Fig. 4. Development Indicators of Vocational Education Industry in the Digital Age

Table 1. Comparison of the Dimensional Changes in Vocational Education Management in China in the Digital Age

Management Dimension	Traditional management model	Digital management model	Results of the reform
Governance Model	Hierarchical control, unilateral government leadership, and severe information barriers	Data-driven, multi-party governance involving government, industry, enterprises, and universities.	Governance efficiency improved by more than 30%, and decision-making accuracy significantly increased.
Resource allocation	Resource fragmentation makes cross-regional and cross-institutional sharing difficult.	Digital integration and resource sharing become normalized and precise.	Resource utilization rate increased by 45%, and the cost of redundant construction decreased by 50%.
School Management	The system is primarily manual, with cumbersome processes and low efficiency.	End-to-end digitalization, intelligent management and control, and precise service	Operational efficiency improved by 35%, and management costs decreased by 25%.
Quality evaluation	Government-led evaluation, static assessment, and single indicator	Multi-dimensional evaluation, dynamic monitoring, and comprehensive indicators	Improved scientific rigor in evaluation leads to continuous optimization of talent cultivation quality.

The widespread application of digital technology has driven profound changes in my country's vocational education management model, transforming it from traditional hierarchical control to data-driven, multi-party collaborative governance. This has resulted in comprehensive optimization in resource allocation, school management, and quality evaluation. Furthermore, the effectiveness and core characteristics of these management changes are visually presented through charts, as detailed below:

From a governance perspective, traditional vocational education governance is primarily hierarchical, with the government leading all management activities. Low participation from schools, enterprises, and industries, coupled with severe information barriers, leads to resource misallocation and delayed decision-making. In the digital age, the construction of a national vocational education data platform enables data interconnection among government, industry, enterprises, and schools, establishing a four-party co-governance mechanism. Leveraging big data analytics for intelligent decision-making effectively breaks down information barriers and improves governance efficiency and decision-making accuracy. From a resource allocation perspective, traditional vocational education resources are fragmented, making cross-regional and cross-institutional resource sharing difficult and resulting in low resource utilization. Digital transformation promotes the digital integration of teaching resources, faculty resources, and practical training resources. The national vocational education smart platform enables cross-regional and cross-institutional resource sharing, allowing for readily accessible online courses and virtual training resources, effectively improving resource utilization and reducing redundant construction.

From the perspective of institutional management, traditional institutional management relies primarily on manual operations, resulting in cumbersome, inefficient, and easily loophole-prone processes in teaching, student, and financial management. In the digital age, institutions build digital management platforms to achieve intelligent management across the entire process of teaching, student, and financial management. Teaching platforms enable student learning analysis and personalized instruction, student management allows for digital traceability of student records, employment, and skills certification, and financial management enables precise monitoring of funds and cost accounting, significantly improving operational efficiency and reducing management costs. From the perspective of quality evaluation, traditional quality evaluation is mainly based on government evaluation, employing static assessment methods. Evaluation indicators primarily focus on teaching outcomes, neglecting core indicators such as industry fit and employment quality. Digital transformation drives quality evaluation towards multi-party collaboration and dynamic monitoring. Evaluation subjects are expanded to include enterprises, students, and society, and evaluation indicators incorporate core content such as digital skills, employment quality, and industry fit. Real-time monitoring of the entire talent cultivation process through big data enables dynamic evaluation, improving the scientific rigor and comprehensiveness of the evaluation and promoting continuous optimization of talent cultivation quality.

5. Problems and Challenges Facing the Economic and Management Development of Vocational Education in China in the Digital Age

Although China's vocational education digital transformation has achieved phased results and made certain breakthroughs in economic investment and management models, it still faces many problems and external challenges that hinder the high-quality development of vocational education digitalization. In the economic dimension, the total investment in digitalization is insufficient, with significant gaps in investment between regions and institutions. The gap in digitalization investment between vocational schools in the eastern and central-western regions, and between urban and rural areas, continues to widen. Some rural vocational schools have rudimentary digital infrastructure, which is insufficient to meet teaching and practical training needs. The investment structure is unreasonable, exhibiting a phenomenon of "emphasizing hardware

over application, and construction over maintenance." Many institutions invest heavily in purchasing digital equipment but lack subsequent application training and maintenance funds, resulting in low equipment utilization and difficulty in achieving practical effectiveness. Enterprises are not highly motivated to participate in digitalization investment, and the collaborative mechanism is incomplete. Enterprise investment is concentrated in large enterprises, with low participation from small and medium-sized enterprises, and a lack of effective incentive and benefit protection mechanisms, leading to insufficient synergy in school-enterprise collaborative investment. The cost-benefit evaluation system for digitalization investment is imperfect, lacking scientific evaluation indicators and methods, making it difficult to accurately measure the economic and social benefits of digitalization investment, resulting in low investment efficiency.

In terms of management, data silos have not been completely broken down. Data standards among governments, universities, and enterprises are inconsistent, and data sharing is inefficient, leading to unreasonable resource allocation, low decision-making efficiency, and difficulty in achieving collaborative governance among multiple stakeholders. There is a shortage of digital management talent, with insufficient digital literacy among university administrators and a lack of compound talents who understand both vocational education and digital technology and management. This makes it difficult to effectively implement digital management models, and digital construction in some universities becomes merely a formality. The integration of digital teaching and management is not deep enough, with a prominent problem of "emphasizing form over substance." Some universities have only built digital platforms but have not deeply integrated digital technology with the core aspects of teaching and management, making it difficult to leverage the empowering role of digitalization. The multi-party co-governance mechanism is incomplete, with insufficient voice for industry and enterprises in vocational education management. They are unable to effectively participate in core aspects such as professional setting and talent training program development, resulting in a disconnect between talent training and industry needs.

Externally, digital technologies are rapidly evolving, with emerging technologies like artificial intelligence and blockchain constantly appearing. However, the digitalization of vocational education lags behind, struggling to keep pace with technological advancements. This results in outdated digital equipment and curriculum content, failing to meet the demands of industrial digital transformation. Furthermore, the rapid iteration of skilled personnel needs driven by industrial digital transformation shortens the update cycle for digital skills. Vocational education, however, lags behind, making it difficult for curriculum design and teaching content to quickly adapt to industry demands, leading to a gap between the supply and demand of digitally skilled personnel. Finally, digital ethics and data security issues are becoming increasingly prominent. Vocational schools handle large amounts of sensitive information, including student personal data and teaching data. Some schools have inadequate data security management systems, leading to issues such as student information leaks and data misuse. Additionally, digital teaching faces ethical challenges such as information silos and internet addiction, hindering the healthy development of digital vocational education.

6. The Development Path of Vocational Education Economics and Management in China in the Digital Age

Addressing the current problems and challenges facing the digital development of vocational education in my country's economic and management sectors, and drawing on advanced international experience and my country's development realities, this paper proposes targeted development paths from five dimensions: economic investment, governance system, industry-education integration, capacity building, and support system, to promote high-quality digital development in vocational education. Regarding optimizing the digital investment mechanism and strengthening the economic foundation, this paper calls for increased government financial investment, improved fiscal investment tilting mechanisms, prioritizing vocational schools in the central and western regions and rural areas, raising the per-student digital special funding standard, and addressing regional development shortcomings; incentivizing enterprise participation by improving tax breaks and subsidies, providing tax reductions and financial subsidies to enterprises participating in vocational education digitalization, building a school-enterprise collaborative investment mechanism, clarifying the profit distribution methods between enterprises and schools, and enhancing enterprise participation; guiding social capital participation by standardizing PPP models and donation mechanisms, broadening investment channels, and encouraging social forces to participate in projects such as the construction of vocational education digital platforms and the creation of virtual training bases; and establishing a digital investment cost-benefit evaluation system, developing scientific evaluation indicators and methods, regularly evaluating the economic and social benefits of digital investment, optimizing the investment structure, and improving investment efficiency.

To improve the digital governance system and enhance management efficiency, it is necessary to break down data silos, establish a unified national standard for vocational education data, build a national vocational education data sharing platform, and achieve data interconnection and interoperability among government, schools, enterprises, and industries to promote the sharing and utilization of data resources. A multi-party governance mechanism should be constructed, strengthening industry guidance and enterprise participation, clarifying the responsibilities of government, schools, enterprises, and industries, enhancing the autonomy of schools, and encouraging industry and enterprises to participate in core aspects such as curriculum design, talent training program development, and quality evaluation to form a collaborative governance force. Furthermore, the digital transformation of school management should be promoted, driving intelligent management of the entire process, including teaching, students, finance, and practical training, optimizing management processes, improving operational efficiency, reducing management costs, and achieving deep integration of digital management with school development.

In deepening the integration of industry and education through digitalization and promoting collaborative development, we must build digital industry-education consortia and industry colleges, establish a collaborative digital platform between schools and enterprises, achieve real-time connection between industry needs and talent cultivation, and promote the alignment of enterprise technical standards with school teaching content and practical training projects; promote virtual simulation training and order-based digital training models, relying on virtual training bases to simulate enterprise production scenarios, improve students' digital skills and practical abilities, and carry out order-based training according to enterprise needs to achieve precise matching between talent cultivation and enterprise positions; promote the joint construction of digital training bases and sharing of technical resources between schools and enterprises, encourage enterprises to introduce advanced digital equipment and technologies into schools, and enable schools to provide enterprises with technical services, achievement transformation and employee training to achieve two-way empowerment and collaborative development between schools and enterprises.

To strengthen digital capabilities and address talent shortages, we must enhance the training of digital teachers, conduct specialized training in digital teaching and management, improve teachers' digital teaching abilities and managers' digital literacy, establish a digital teacher evaluation system, and incorporate digital skills into teacher assessment indicators; introduce digital management talent, optimize the structure of school management teams, recruit compound talents who understand both vocational education and digital technology and management, and improve the level of digital management in schools; and improve the student digital skills training system, incorporate digital skills into talent training programs, add digital-related courses, strengthen virtual simulation training, enhance students' digital skills, and cultivate skilled talents who can meet the needs of industrial digital transformation.

In terms of improving the support system and preventing development risks, it is necessary to improve relevant digital policies and regulations, formulate special regulations for the digital development of vocational education, standardize data collection, use, and storage, strengthen the protection of student information security, and prevent data leakage and

misuse; establish a digital quality monitoring system to strengthen dynamic monitoring of the digital construction, teaching application, and investment effectiveness of vocational schools, avoid formalistic transformation, and ensure that digital construction achieves practical results; increase digital support for vocational schools in the central and western regions and rural areas, and make up for regional development shortcomings through financial support, technical guidance, and resource sharing, narrow the gap in digital development between vocational schools in the eastern and central-western regions and between urban and rural areas, and promote the balanced development of vocational education.

Conclusion

Digitalization has become a core driving force for the economic and management transformation of vocational education in China. With the widespread application of digital technology, China's vocational education has achieved significant breakthroughs in economic investment and management models, forming a diversified and collaborative investment pattern and a data-driven management model, laying a solid foundation for the high-quality development of vocational education. Currently, China's vocational education digitalization development has achieved phased results, with continuously improving policy support, sustained increases in economic investment, increasingly widespread technology applications, and gradually emerging practical achievements, playing an important role in talent cultivation and industrial empowerment. However, it also faces many prominent problems. Economically, there are issues such as insufficient total investment, an unreasonable structure, low enthusiasm for enterprise participation, and imperfect cost-benefit assessments. Management-wise, there are problems such as data silos, talent shortages, insufficient integration, and an unsound co-governance mechanism. Externally, there are challenges such as rapid technological iteration, lagging talent cultivation, and data security risks.

To promote the high-quality development of vocational education's economy and management in the digital age, it is necessary to base ourselves on my country's development realities, learn from advanced international experiences, and address development challenges and mitigate risks through optimizing digital investment mechanisms, improving digital governance systems, deepening the integration of industry and education in digitalization, strengthening digital capacity building, and improving support systems. Research indicates that the digital transformation of vocational education's economy and management is an inevitable requirement for adapting to industrial digital transformation, cultivating new productive forces, and building a skills-based society. Through synergistic optimization of both economic and management dimensions, the efficiency of vocational education investment and management can be effectively improved, achieving synchronized development of talent cultivation and industrial growth, and providing strong support for the high-quality development of vocational education in my country.

References

1. H Cui, H Dong, and M Ulanbek. Digital literacy development of vocational college teachers: An industry-integrated TPACK framework and intervention study. *Australasian Journal of Educational Technology*, 2026.
2. J Diao, X Tang, and X Ding. How do nations around the world navigate the digitalization of vocational education policies. *Education and Information Technologies*, 30:19803–19831, 2025.
3. F Li. Proposing an Optimal Strategy for Modernization Path Design of Vocational Education Governance Based on Multi-Objective Planning Approach. *International Journal of Computer Information Systems and Industrial Management Applications*, 18:18–18, 2026.
4. J Li. Research on the Policy Evolution and Paradigm of Vocational Education Talent Cultivation in the Digital Age. *2025 5th International Conference on Education, Language and Art (ICELA 2025)*, pages 191–199, 2026.
5. X Ma, M Chen, and J Diao. Pathways and outcomes of digital transformation in Chinese vocational colleges. Vocation. *Technology & Education*, 2(1), 2025.
6. P Phakamach, D Panjarattanakorn, P Saengkaew, S Pangthai, and S Onsampant. Innovative practices in vocational education administration. *International Journal of Educational Communications and Technology*, 3(2):1–19, 2023.
7. E Xue and J Li, 2022.
8. T Yu, X Yan, and Y Jin. Vocational education in China. *China and the World: National Development and Global Benchmarking*, pages 361–418, 2024.
9. H Yuxi and Q Yueqiong. Research On Cost-Benefit Analysis And Path Optimization Of Attracting And Retaining Talents In County-level Vocational Education. *Journal of Exploration of Vocational Education*, 4(3):40–57, 2025.