AI-enabled Vocational Education Teacher Cultivation in the Perspective of Industry-education Integration and Science-education Integration

Zou Xingrong, Lu Guangda, Guo Tinghang

[**Abstract**] In the context of the deep integration of the digital economy and the real economy, this paper takes "AI-empowered education" as its technological driving force, focusing on the synergistic development of industry-education integration and science-education integration, to systematically construct a digital transformation framework for the cultivation of vocational education faculty. The research focuses on the need to reconstruct teachers' capabilities in the intelligent era. Through a "three-dimensional modular" curriculum restructuring, operational training for generative AI tools such as DeepSeek and ChatGPT is deeply embedded into the teacher training system, aiming to cultivate a new generation of vocational education faculty with AI-driven teaching transformation capabilities. The specific implementation path includes three innovative dimensions. First, it constructs a "1 + 3 + X" discipline construction system, adding three core modules—AI core technology, digitalization of vocational skills, and modern information technology literacy—to the public foundation module, and developing X intelligent teaching scenario application modules tailored to the characteristics of professional clusters. Second, a "dual-teacher" AI project practical training platform is established, adopting an "AI + industry" dual-drive model to enable teachers to master composite teaching capabilities in "AI + professional fields" through real-world enterprise projects. Establish a school-enterprise collaborative teacher training base, jointly build an intelligent training base, and form a research collaboration mechanism where "enterprises pose problems, universities solve them, and classrooms disseminate solutions". Third, establish a cross-domain research collaboration mechanism driven by the integration of science and education, promote the conversion of research outcomes into teaching resources, and form a virtuous cycle of interaction among "research, teaching, and industry". This provides a composite teacher support system for high-quality vocational education development that combines technical adaptability and educational innovation. This study breaks through the linear thinking of traditional faculty development and constructs a three-dimensional empowerment model of "technical adaptation—teaching transformation—research feedback". By establishing an AI teaching resource repository, developing an intelligent teaching assessment system, and building a cross-domain research collaboration platform, it achieves a qualitative leap from the application of technical tools to a paradigm shift in teaching.

[**Key words**] vocational education teacher training; industry-education integration; science-education integration; AI-enabled education

[**About the author**] Zou Xingrong (1995—), female, from Yantai, Shandong, China, master candidate in vocational technical education at Tianjin University of Technology and Education. Lu Guangda (1978—), male, from Baoding, Hebei, China, postdoctoral researcher and professor at Tianjin University of Technology and Education. Research interests: artificial intelligence, intelligent robotics technology, and machine vision. Guo Tinghang (1984—), male, from Jining, Shandong, China, lecturer at Tianjin University of Technology and Education, PhD. Research interests: artificial intelligence, intelligent detection, and embedded system development.

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1 Introduction

In September 2024, the General Secretary emphasized at the National Education Conference that "education is the foundation for the construction of a strong nation and the revival of the nation", "implement the action of casting souls and strengthening teachers in the spirit of educators", and "strengthen the construction of high-quality and professional teacher teams and carry forward the spirit of educators". The construction of a strong educational state is a precursor to the modernization of China to promote the construction of a strong nation and the rejuvenation of the nation. Vocational education, as an important part of the national education system, is of strategic significance to the construction of a strong education and talent country. The key to the development of vocational education lies in teachers, and the quality of teachers depends on the cultivation of VET teachers. The fourth industrial revolution driven by artificial intelligence is triggering deep changes in the industrial ecology and economic pattern, and this change has formed a subversive impact on the traditional employment field of vocational colleges and universities, thus accelerating the paradigm reconstruction of the vocational education teacher training system. Exploring the new path of AI-enabled vocational education teacher training under the perspective of industry-education integration and science-education integration will, on the one hand, help to provide high-level talent guarantee for the construction of China's modern vocational education system, and on the other hand, it will also be beneficial to proactively cater to the structural adjustment of China's economy, which will contribute to the development of China's vocational education system from a "manufacturing power" to a "manufacturing power", to provide high-quality skilled personnel.

2 Status of vocational education teacher cultivation

The state attaches great importance to the construction of vocational education teachers, has issued the "Notice on the Implementation of Vocational College Teachers' Quality Improvement Program (2021—2025)", "Promoting Artificial Intelligence to Help Educational Transformation", "Deepening the Reform of Vocational Education 'Dual-teachers' Teachers' Squad Construction in the New Era Implementation Program", "Notice on the Action to Enhance the Capability of Vocational Education Teacher Teams" and other policy documents have made a series of decisions and deployments to build a high-quality "dual-teacher" teacher team, with the intention of strengthening the cultivation of vocational education teachers, promoting the high-quality development of China's vocational education, and explicitly proposing the strengthening of the integration of industry and education and the integration of science and education, promoting the transformation of applied units, and promoting the development of the vocational education system. It clearly puts forward the importance and specific measures to strengthen the integration of industry and education, science and education, and to promote the transformation of application-oriented units and the construction of a "dual-teacher" teaching force. The report of the 20th Party Congress also unified the deployment of education, science and technology, and talents, emphasizing the need to promote the integration of vocational and popular education, the integration of industry and education, and the integration of science and education, and pointing out a new direction for vocational education.

Industry-education synergy has undergone paradigm transformation driven by four technological revolutions, as shown in Figure 1. In the steam era, the school form of vocational education took shape based on mechanical manufacturing technology; in the power era, electrification technology promoted the large-scale development of secondary vocational education, and constructed the integration ecology of "school-run factories—industry practical training"; in the information era, computer and Internet technology empowered the rise of higher vocational education, gave rise to the cluster of specialized colleges and universities led by the "double-high plan", and realized the initial integration of virtual simulation teaching system and CAD/CAM technology; in the digital intelligence era, the 5G teaching system was integrated into the vocational education system; and in the digital intelligence era, the 5G teaching system has been integrated into the vocational education system. Initial integration; 5G technology in the era of digital intelligence drives industry-education collaboration into the quantum leap period—through the industrial Internet of Things platform to realize the digital twin mapping of the teaching process and the production process, relying on the federated learning architecture to build a cross-domain

knowledge-sharing network, and the use of multimodal knowledge mapping technology to break down the barriers of disciplines, forming a through-training system that covers the undergraduate vocational education and master's degree levels. It forms a coherent cultivation system covering vocational undergraduate and master's degree levels. Generative AI reshapes the curriculum development model and reconstructs the collaborative governance mechanism between schools and enterprises, and promotes modern vocational education to enter a new era of "industry-education digital community" construction. China's vocational education teacher training started late, is still learning from developed countries, in the stage of experience accumulation. At present, China has already formed the professional development mode of VET teachers with "higher education (technical teacher training colleges) training as the main body, 93 national VET teacher training bases and teachers' post-service enterprise practice as the auxiliary". VET teacher training is an ideal carrier for the further development of industry-education integration and science-education integration because of its "four-in-one" attributes of academics, teacher training, vocationality and innovativeness.

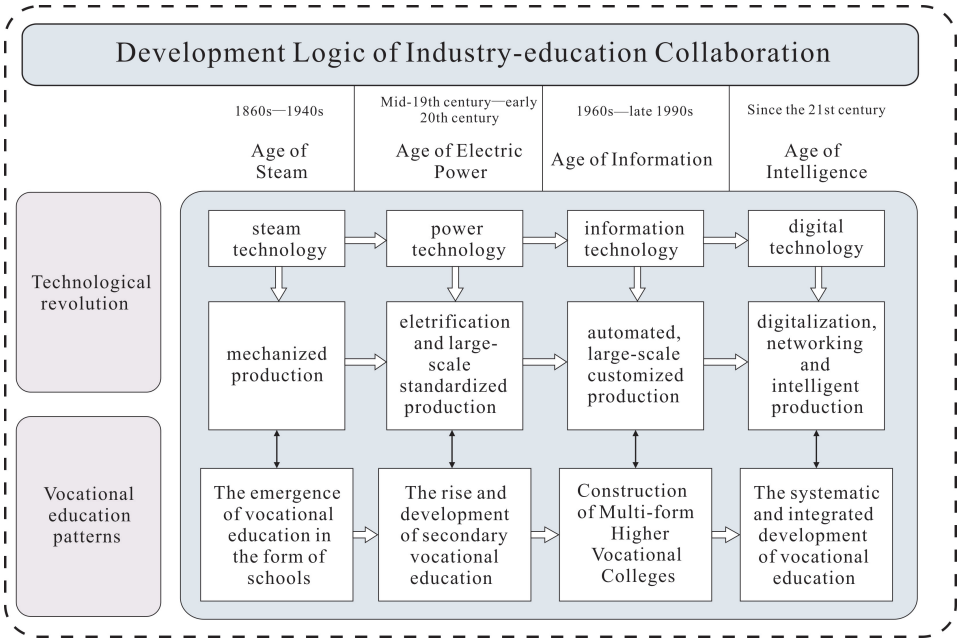

Figure 1. Development logic of industry-education collaboration

3 Realistic problems of vocational education teacher cultivation process

3.1 Rigid discipline construction system

In the discipline construction system of vocational education teacher training in China, the traditional single-discipline concept and discipline classification system have long dominated, leading to a relative lag in the development and change of discipline catalogs. The current disciplinary classification system still follows the "disciplinary silo" model formed in the 1980s, and in the latest *Catalogue of Vocational Education Specialties* (*Version 2023*) of the Ministry of Education, emerging cross-cutting fields such as intelligent manufacturing and industrial Internet are still mechanically disassembled and categorized into single disciplines such as mechanical engineering and electronic information. This kind of fragmented management leads to structural mismatch between the professional settings of vocational colleges and the evolution of industrial technology. Typical examples are the new energy automotive technology program, whose curriculum system still remains at the level of a simple superposition of traditional vehicle engineering and electrical engineering, failing to build cross-curricular modules covering cutting-edge fields such as intelligent network connection, battery management, and so on. Limited by the catalog of disciplines under the influence of this single-discipline view, it is difficult for the cultivation of vocational education teachers and talents to step up to a higher level, and it is also difficult for them to effectively respond to

the lack of adaptability between vocational and technical education and the major national needs. Modern science and technology present the distinctive characteristics of multidisciplinary cross-fusion, and scientific research should cross the boundaries of a single discipline and realize interdisciplinary convergence and integration, thus giving rise to the development and growth of new disciplines. However, in the current development mode of cultivating vocational education teachers, there are many limitations in interdisciplinary communication and integration, and students lack cross-disciplinary thinking ability training, making it difficult for them to meet the challenges of solving complex practical problems.

3.2 Insufficient practical participation of VET teachers

Vocational education teacher training units do not have a deep enough understanding of the policies on the educational practice of vocational education, and lack a systematic and clear understanding. The state has continued to guide the training of M.Ed. in the field of VET at the policy level, and has specially formulated and updated relevant documents for the practice teaching part. These documents have put forward more detailed requirements for the implementation of educational practice, but in practice, many training institutions have not interpreted the documents thoroughly enough. On the one hand, they do not have a comprehensive enough knowledge of the various aspects of educational practice. Educational practice in the process of vocational education teacher training should include educational apprenticeships, internships, and seminars, as well as microteaching, lesson analysis, classroom management practices and other forms. However, in actual implementation, many colleges and universities focus too much on educational internships and integrate apprenticeships into internships, resulting in the marginalization of apprenticeships and internships. In addition, the forms of educational practices are too homogeneous, failing to make full use of the resources of specialized courses on campus, resulting in the lack of a comprehensive understanding of the whole picture of educational practice among M.Ed. students in the field of VET. On the other hand, they do not have a deep enough understanding of the significance of educational practice. Educational practice is crucial to the cultivation of teaching practice ability and teaching research ability of VET teachers. However, some training institutions, drawing on past schooling experience, have positioned the goal of educational practice as too academic and the curriculum lacks rationality. In fact, the master of education in the field of vocational education spends too much time on theoretical courses on campus and has fewer opportunities to visit and understand secondary schools, which leads to time constraints in educational practice at a later stage and affects the quality of practice.

3.3 Insufficient integration of scientific research and teaching

The integration of science and education implies the organic combination of technological innovation and education and teaching to form a new model of mutual promotion and common development. However, in the current practice of vocational and technical education, substantive integration between scientific research and teaching has not been realized. This status quo restricts the quality and efficiency of VET teacher training, and also affects the close connection between VET and industrial development. Existing platforms for VET teacher training often focus on single research or teaching, and lack mechanisms and environments to integrate the two organically. Research platforms tend to focus on technological research and innovation, while teaching platforms are more focused on knowledge transfer and skill development. This segmented platform positioning makes it difficult to effectively transform scientific research results into teaching resources, and it is difficult to feedback practical problems in the teaching process into scientific research to form a virtuous cycle.

4 Exploration of vocational education teachers' training strategy paths

In response to the aforementioned issues currently facing vocational education teachers in China, a multi-pronged approach should be adopted. Based on the professional needs of vocational school teachers in the new era of industry-education integration and school-enterprise cooperation, as well as the labor demand of industries, enterprises, and governments, a comprehensive and systematic reform of education and teaching should be carried out. A "dual-qualified" teacher training base integrating industry-education integration and science-education integration should be jointly established by schools, enterprises, and governments.

4.1 Innovation of vocational education teacher discipline construction system

4.1.1 Adding AI core discipline modules

Add AI core discipline modules (as shown in Figure 2) in the process of VET teacher training, take the national policy guidance as the benchmark, combine the dual path of industry-education integration and science-education integration, and build a hierarchical and progressive discipline system with virtual and real linkage. Following the requirements of *The Vocational Teacher Training Standards for Undergraduate Teachers*, the AI courses are incorporated into the "dual-teacher" teacher training standards, and are systematically designed from the knowledge structure of professional teachers such as the principles of machine learning and natural language processing technology to the practical abilities of teachers such as the development of AI teaching aids and the analysis of intelligent learning conditions. The course module can be divided into three levels: firstly, the basic cognitive level, covering AI ethics, algorithm principles and educational application scenarios such as intelligent assessment, virtual simulation, etc., and embedding cross-disciplinary cases in combination with the standard of "Teacher's Digital Literacy"; secondly, the technical application level, carrying out the "AI + professional course" project training, integrating the enterprise's real dataset and parameter tuning practice; and finally, the innovation and application level; lastly, the innovation and expansion layer, through the school-enterprise co-construction laboratory, promotes the in-depth integration of AI technology and teaching scenarios, develops a personalized learning path recommendation system based on knowledge graph, and carries out quantitative assessment of teaching effects. The operational training of generative AI tools such as DeepSeek and ChatGPT is embedded in the teacher training to strengthen the teachers' ability to translate AI technology into teaching.

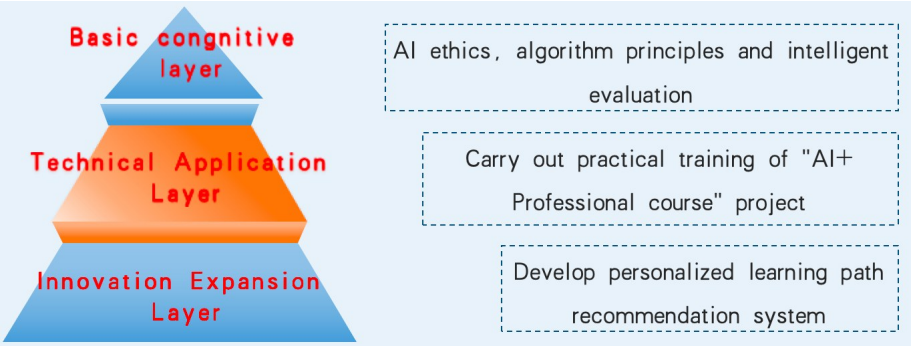

Figure 2. AI core discipline modules

4.1.2 Strengthening vocational skills subject modules

Increase the intensity of VET teacher training, attachments to enterprises, and implement a system of school-enterprise or government and industry attachments and exchanges every two to three years. Organize full-time teachers and part-time teachers to make use of the winter and summer vacation time to have intensive practical training in on-campus training bases, school-enterprise cooperation bases or enterprises. Encourage VET teachers to apply for industry qualification certificates, take the national vocational skills level exams, actively participate in projects such as horizontal subject research and application technology development in enterprises, and broaden social service channels, along with the necessary supervision and constraint mechanisms. Regularly organize teachers' vocational skills competitions, innovation and entrepreneurship competitions and teaching skills competitions, so as to strengthen the practical ability of VET teachers and improve the evaluation and assessment mechanism.

4.1.3 Providing subjects related to modern information technology literacy

In the information age, VET teachers are required to build an intelligent retrieval system based on the DeepSeek large language model, be proficient in the use of search engines, professional websites and academic resource libraries, have superior information retrieval and processing capabilities, accurately locate educational

resources through collaborative filtering recommendation algorithms, and utilize multimodal semantic parsing of information with the use of natural language processing technology. VET teachers need to master the knowledge graph construction technology in order to accurately obtain the most valuable and suitable educational resources in the vast ocean of information. VET teachers need to be skillful in the use of network tools to assist teaching and learning activities, and master multimedia production, data analysis, virtual simulation (platform flow chart shown in Figure 3) and other types of information processing technology. They also need to be able to flexibly use network technology, information technology and multimedia technology to carry out project-based learning, problem-driven learning, interesting teaching mode and process assessment. With the help of virtual reality and other cutting-edge information technology means, in-depth innovation of the traditional teaching mode, in the future engaged in teaching to create an immersive audio-visual interactive experience for students in the teaching environment. Online teaching platforms such as flipped classroom and online conference system should also be fully utilized to guide VET teachers to carry out remote online learning and improve remote teaching ability.

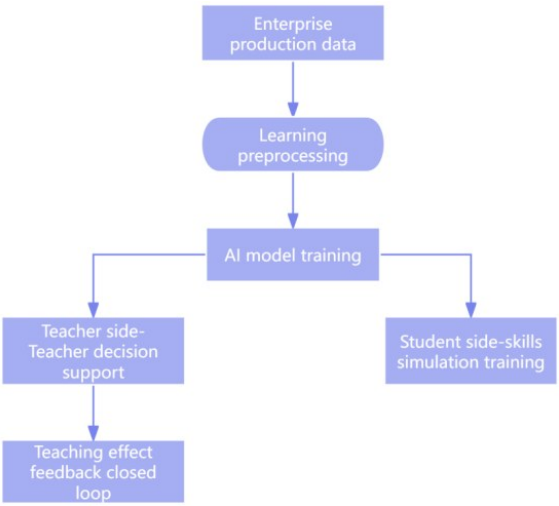

Figure 3. Flow chart of virtual simulation platform

4.2 Further strengthen the university-enterprise cooperation of industry-education integration

4.2.1 School-enterprise cooperation in building intelligent training bases

School-enterprise cooperation to jointly build a training base for vocational teachers is an important initiative to improve the quality of vocational education and promote the deep integration of industry and education. The two sides should plan the construction of the base together based on the policy orientation of the Action Plan for the Construction of Artificial Intelligence + Teachers, with DeepSeek and other big models as the technological base, with a clear goal of cooperation, and adhering to the principles of complementary advantages, resource sharing, and win-win situation for mutual benefit. In terms of cooperation mode, we can adopt the "AI + Industry" dual-wheel drive mode, and build a federal learning collaborative R&D platform and other innovative forms. In terms of integration of industy and education, schools and enterprises are encouraged to jointly declare scientific research projects, carry out technological innovation and product development, and accelerate the transformation of scientific and technological achievements. Integrate on-campus training rooms, scientific research equipment and enterprise project resources to form a shared education and teaching, science and technology innovation resource base, and enhance the social service capacity of the base. The university and enterprises should establish a regular evaluation mechanism to assess the construction and operation of the base, identify problems and take improvement measures in time. Through continuous optimization of the cooperation mode, curriculum system and management mechanism, the base will always maintain its vitality and competitiveness, and provide strong support for the high-quality development of vocational education.

4.2.2 Introducing enterprise experts to participate in teacher training

Schools should establish mechanisms and platforms for school - enterprise cooperation, clarify the responsibilities and rights and interests of both parties, and ensure that enterprise experts can participate in teacher training smoothly. Through the signing of cooperation agreements, the objectives, contents, methods and evaluation standards of the training are clarified, and the necessary support and guarantee are provided for the enterprise experts. Then, according to the characteristics and needs of vocational education, design targeted training courses and content. Corporate experts can draw on their own practical experience and industry trends to provide vocational teachers with practical skills training, case studies, and practical guidance, helping teachers understand the latest industry developments and improve their practical skills and professional qualities. At the same time, flexible and diversified training methods, such as workshops, seminars, field trips, etc., can be adopted to enhance the interactivity and effectiveness of the training. In-depth exchanges and discussions can be held between enterprise experts and teachers to jointly solve practical problems in teaching and promote the sharing and enhancement of knowledge and skills of both sides. Establish a perfect evaluation and feedback mechanism to regularly evaluate and summarize the effect of the participation of enterprise experts in teacher training. By collecting feedback and suggestions from teachers, we will continuously optimize the training courses and content to improve the quality and effect of training.

4.2.3 Establishing a four-in-one industry-education integration and collaboration system

In the process of cultivating vocational education teachers, it is essential to strengthen the integration of industry and education through school-enterprise cooperation. This requires the establishment of an integrated system comprising four interconnected components: policy - driven initiatives, institutional innovation, implementation and deepening, and supportive measures. At the policy level, it is necessary to refine and improve policies on industry-education integration, establish operational guidelines for school-enterprise cooperation, clarify preferential policies for enterprises regarding land use, finance, and taxation, and implement a negative list system to remove barriers to cooperation. At the same time, incentive policies should be improved, such as cost-sharing mechanisms, tax exemptions, and special subsidies, to stimulate corporate enthusiasm for participation. In terms of mechanism innovation, a government-led industry-education integration alliance or working committee could be established to pool resources from vocational colleges and enterprises, jointly formulate talent cultivation plans, and establish a "government-school-industry-enterprise" collaborative platform to promote resource sharing through vocational education groups, industry - education consortia, and other forms. A school - enterprise collaborative talent cultivation system should be established, such as modern apprenticeship programs or dual-track systems, to achieve seamless alignment between talent cultivation and enterprise needs. In terms of implementation pathways, it is necessary to deepen curriculum reforms, integrate real-world enterprise projects into teaching, develop modular courses and flexible textbooks, and strengthen teacher training through enterprise internships and mutual hiring of part-time instructors to enhance teachers' practical capabilities. Co-build training bases and promote collaborative innovation in research, with schools and enterprises jointly applying for projects to facilitate the conversion of technological achievements. In terms of safeguards, improve the funding support system for industry-education integration, ensure the effective use of special funds, and establish an evaluation mechanism for industry-education integration, incorporating the effectiveness of school-enterprise cooperation into school performance metrics to incentivize teachers to participate in industry-education integration.

4.3 Strengthen the application of science and education integration in teacher training

4.3.1 Create a mechanism for cross-domain research collaboration

Enhance teachers' awareness and ability of science and education integration, encourage teachers to apply scientific research results to teaching, deepen teaching content, and at the same time, through the implementation of organized scientific research, better understand the needs of students, and constantly adjust the direction of scientific research and research content. Schools should build an intelligent teaching and research platform based on a large language model, automatically parsing the fitness of scientific research results and teaching scenarios

through natural language processing technology, and generating subject knowledge maps. Teachers can utilize the generative AI toolchain and adopt the DeepSeek lesson plan generation module to transform scientific research papers into virtual simulation teaching cases (the effect of which is shown in Figure 4). The establishment of federal learning collaborative research network realizes cross-institutional data security sharing, helps teachers dynamically adjust their research direction based on real enterprise data sets, and forms a closed loop of "research-teaching-industry". In the process of teacher training, it is necessary to establish a perfect mechanism for the integration of scientific and educational resources and synergy, including the establishment of a mechanism for the exchange of human resources to promote the two-way flow of teachers from vocational schools and excellent researchers from research institutes; the establishment of a mechanism for sharing scientific research resources to promote the joint construction of laboratories and joint scientific research between vocational schools and research institutes. Through these initiatives, the sharing and integration of high-quality scientific research resources are realized, providing strong support for teaching. At the same time, it optimizes the talent training mechanism and promotes the integration of scientific and technological innovation elements into the whole process of talent training.

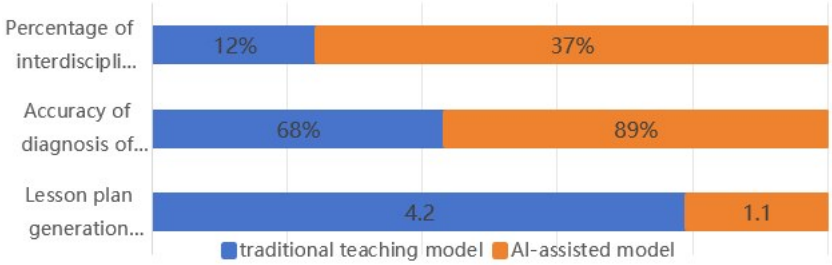

Figure 4. AI performance comparison experiment

4.3.2 Promote the transformation of scientific research results into teaching resources

In the process of strengthening the application of science and education integration in teacher training, promoting the transformation of scientific research results into teaching resources is the key to improving the quality and effectiveness of teaching. This requires educational institutions and teachers to adopt a series of strategies to ensure that research results can be effectively integrated into teaching practice. Construct a comprehensive incentive mechanism for the transformation of research results to fully stimulate the enthusiasm of VET teachers to participate in research activities and effectively transform research results into teaching resources. Set up a special transformation fund to give material rewards and spiritual commendations to projects that successfully realize the transformation of achievements, so as to enhance the motivation and enthusiasm of VET teachers in transforming scientific research achievements into educational resources. Strengthen the training of VET teachers' transformation ability to ensure that they have the ability to transform scientific research results into teaching resources. Through organizing special training, academic seminars and other forms of activities, VET teachers are helped to master cutting-edge teaching concepts and teaching methods, explore and construct diversified modes of transforming scientific research results, and integrate scientific research results into curriculum design and classroom teaching. VET teachers should flexibly use case-based teaching, project-based teaching, inquiry-based learning and other diversified teaching methods according to the specific characteristics of the research results and the actual needs of the teaching content, so as to transform the research results into vivid teaching cases, practical tasks or teaching projects, and allow students to deepen their understanding and application of knowledge during the process of participation. Educational institutions need to build a three-way intelligent transformation system driven by "data flow—knowledge flow—ability flow", and rely on the federal learning architecture to realize the safe docking of scientific research data and teaching scenarios. Drawing on the DeepSeek education model, we have developed a multimodal teaching resource generation tool chain, which automatically analyzes the semantic features of scientific research results, and generates AR/VR demonstration cases, experiment manuals and intelligent assessment question banks.

5 Conclusion

In the context of the deep integration of the digital economy and the real economy, the cultivation of vocational education faculty must break through traditional disciplinary barriers and establish a dynamic development mechanism that is deeply integrated with industrial chains and innovation chains. Vocational education faculty development cannot be detached from the actual needs of industrial development. This requires vocational education institutions to adopt a dual-engine approach of "industry demand-driven + technology innovation-driven"'s establishing a "three-synergy" faculty development system: first, collaborating with leading industry enterprises to establish a faculty development standards committee, using job task analysis to reverse-engineer competency models, ensuring that talent development programs are updated every two years to align professional curriculum systems with industrial technology iteration cycles; second, establish an immersive training model where "real-world enterprise projects are brought into the classroom" such as collaborating with companies like Huawei and Siemens to develop "industrial Internet teaching case packages" transforming real-world scenarios like 5G base station maintenance and smart production line debugging into teaching modules; third, establish a "dual-mentor system" quality assessment framework, where enterprise technical experts and vocational college teachers jointly establish evaluation criteria to achieve comprehensive monitoring from theoretical assessments to practical skills. The deepening integration of science and education requires breaking down traditional barriers between research and teaching to establish a new paradigm for teacher training empowered by digital intelligence. By establishing a three-in-one technical platform integrating "virtual simulation—digital twin—intelligent analysis", AI-driven intelligent training systems are deeply integrated into teaching scenarios: in the field of intelligent manufacturing, digital twin technology is used to replicate Tesla's super factory production lines, enabling teachers to master industrial robot programming and process optimization skills through virtual debugging systems; in the field of digital commerce, a cross-border e-commerce virtual simulation platform is constructed, enabling teachers to conduct teaching by real-time integration with real transaction data from platforms such as Amazon and Alibaba. This "virtual-physical integration" teaching model not only cultivates teachers' ability to construct multi-modal teaching scenarios but also achieves precise conversion from theoretical understanding to practical skills through the dynamic reconstruction of knowledge graphs. To comprehensively enhance teachers' overall competence, a "four-dimensional capability enhancement matrix" should be established: in the professional dimension, teachers should participate in the national key research and development program "Digital Upgrade of Vocational Education" to master cutting-edge industry technologies; in the research dimension, a collaborative innovation mechanism should be established where "enterprises propose problems, teachers solve them, and students practice them"; in the digital intelligence dimension, an AI teaching capability certification system should be developed, covering core modules such as intelligent teaching system design and analysis of learning behavior data; in the practical dimension, implement the "100-day Enterprise Rotation Program", requiring teachers to participate in a certain duration of enterprise practice annually to ensure teaching content aligns seamlessly with industry demands. This composite training model enables teachers to possess "dual-teacher" qualities while also becoming a key driving force in the digital transformation of vocational education.

References:

[1] Zhao Xianmei, Qi Yuheng, Zhuang Huanwei. Research on the Strategy of Improving the Professional Quality of Vocational Education Teachers Based on the Integration of Industry and Education[J]. Science and Technology Wind, 2024(17): 165-167.

[2] Liu F. Research on the Status Quo and Countermeasures of Educational Practice of Master of Education in Vocational Education Field[D]. Tianjin: Tianjin Vocational and Technical Normal University, 2024.

[3] Hu X., Zhang J., Wen Y., et al. Exploration on the Cultivation of "Dual-teacher" Vocational Education Teachers[J]. Journal of Chemical Engineering, 2021, 35(8): 55-56.

[4] Zheng Xiyan, Zhou Qichao, Cen Jian, et al. Vocational Teacher Training Strategy for Electrical

Engineering and Automation under the Background of New Engineering[J]. Modern Business Industry, 2024, 45 (10): 240-244.

[5]Shu Dandan. Research on the Construction of Applied Talent Cultivation System Based on the Concept of Professional Certification of Engineering Education[D]. Daqing: Northeast Petroleum University, 2019.

[6] Hu K., Zhang B. Research on Five-dimensional Framework System of Applied Innovative Talents Cultivation Based on the Concept of OBE-CDIO—Taking Network Engineering Major as an Example[J]. Journal of Texas College, 2022, 38(4): 92-96.

[7]Yang Shujun. Exploring the Problems and Countermeasures of Cultivating Master's Degree in Vocational and Technical Education—Based on the Perspective of Autoethnography[J]. Jiangsu Higher Vocational Education, 2024, 24(5): 99-108.

[8]Hsieh Chia-ching, Tseng Shao-wei. Implementation Value, Mechanism Construction and Realization Path of Science and Education Integration in Vocational Education[J]. Vocational and Technical Education, 2023, 44(22): 33-40.

[9]Zhao Yanjie, Chen Jing. Research on Optimization and Transformation Strategy of Scientific Research in Higher Vocational Colleges and Universities under the Background of Science and Education Integration[J]. Journal of Hubei Institute of Industrial Vocational Technology, 2023, 36(6): 16-19.

[10]Wang Zujun. Multiple Measures to Build a Solid Fortress of Education Security[J]. Henan Education (Teacher Education), 2024(S1): 23-24.

[11]Wang L., Wu H. Exploring the Path of Cultivating Professional Quality of Higher Vocational Teachers Based on Connotation Analysis[J]. Journal of Chengdu Normal College, 2022, 38(8): 30-39.

[12]Zhang Xueying, Cui Zhili, Zhao Wei, et al. Research on Vocational Education Teacher Cultivation in Response to the Demand for Skilled Talents under Artificial Intelligence[J]. Theory and Modernization, 2020(4): 64-72.