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Innovative Research on the Cultivation Path of Digital Talents in Vocational Education under the Background of Digital Economy

Meili Tian

Shandong Transport Vocational College, Weifang, 261206, Shandong, China

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Abstract: In April 2024, nine departments including the Ministry of Human Resources and Social Security and the Ministry of Education issued the "Action Plan for Accelerating the Cultivation of Digital Talents to Support the Development of the Digital Economy (2024-2026)", stating that it is necessary to closely follow the needs of the development of digital industrialization and industrial digitalization, and solidly carry out the cultivation of digital talents to support the high-quality development of the digital economy. This article aims to cultivate "digital craftsmen" who can adapt to the development needs of the digital economy. Through research on strengthening the key digital school-running capabilities of vocational schools, building an industry-education integration "digital craftsman" education platform, and constructing and improving the evaluation system for "digital craftsmen", it strives to enhance the effectiveness of digital talent cultivation in vocational education and empower and accumulate strength for the high-quality development of the digital economy.

1. Introduction

To implement the decisions and plans of the Central Committee of the Communist of China and The State Council on developing the digital economy, to leverage the fundamental role of digital talents in supporting the digital economy, to accelerate the formation of new quality productive forces, and to empower and accumulate strength for high-quality development, the Ministry of Human Resources and Social Security, the Ministry of Education, and seven other departments have issued the "Action Plan for Accelerating the Cultivation of Digital Talents to Support the Development of the Digital Economy (2024-2026)"[1-4]. In line with the development needs of digital industrialization and industrial digitalization, over a period of about three years, we will earnestly carry out special actions for the cultivation, introduction, retention and utilization of digital talents, increase the effective supply of digital talents, and form an agglomeration effect of digital talents. Against this backdrop, vocational colleges should deeply understand the significance of strengthening the cultivation of digital talents. Standing at the political height of cultivating talents for the country, they should focus on fostering a large number of high-level digital talents to empower and accumulate strength for the high-quality development of the digital economy. This paper focuses on cultivating "digital craftsmen" who can adapt to the development needs of the

digital economy [5-7]. It proposes innovative paths such as strengthening the key digital school-running capabilities of vocational schools, building an industry-education integration "digital craftsman" education platform, and constructing and improving the evaluation system for "digital craftsmen", providing theoretical guidance and practical basis for the cultivation of digital talents in vocational education under the background of the digital economy. The specific research on talent cultivation paths is as follows [8-9].

2. Enhance Teachers' Digital Teaching Capabilities

Enhancing teachers' digital teaching capabilities is an inevitable choice for the high-quality development of education and holds a key position in the current educational reform. It has brought a brand-new atmosphere to the classroom and broken through the boundaries of traditional classrooms. With the help of multimedia and AI tools, interactive teaching has become a reality. Knowledge is no longer presented in dull words but in a vivid and interesting form, making the transmission more efficient. The application of online platforms enables the sharing of high-quality educational resources. No matter where they are, students can access a wealth of learning materials, which effectively promotes the realization of educational equity. At the same time, it prompts a transformation in the role of teachers, from mere "transmitters" to "learning designers". Teachers can use data to accurately diagnose students' learning conditions and tailor growth plans for each student. Furthermore, in the process of digital teaching, students' digital literacy is also cultivated imperceptibly, reserving innovative talents with strong adaptability for the future era of artificial intelligence. This is not only an innovation in teaching technology, but also a significant upgrade in educational concepts, laying a solid foundation for building a lifelong learning system for all [10].

At present, the construction of vocational education teachers mainly focuses on strengthening skills. However, there is a relative shortage of teachers who possess both solid digital capabilities and high-level professional qualities. To improve this situation, it is necessary to open up multiple channels and take multiple measures to comprehensively enhance teachers' digital capabilities. First, we will introduce high-level digital teaching staff. During the process of teacher recruitment, we will clearly consider having digital qualities as an important factor and give priority to selecting professional teachers with a digital background, making digitalization a key criterion for evaluating teacher recruitment. The second is to enhance the digitalization and big data application capabilities of existing teachers. Specifically, it includes the following aspects: Strengthening the training of digital teaching concepts to make teachers understand that digital teaching is an inevitable trend of educational modernization and an effective way to improve teaching quality. Vocational schools regularly conduct digital teaching skills training, including basic knowledge of information technology, operation of teaching software, application of online teaching platforms, etc., to ensure that teachers master the relevant skills proficiently. Vocational schools encourage teachers to participate in online or offline professional training and seminars to learn the latest digital teaching theories and technologies and continuously improve their teaching levels. Vocational schools implement digital teaching practices, encouraging teachers to apply digital teaching technologies to actual teaching, and enhancing teaching effectiveness and students' learning interest through methods such as flipped classrooms and blended teaching. Vocational schools carry out digital teaching observation and exchange activities, enabling teachers to learn from each other, draw on each other's experiences, and jointly improve their digital teaching capabilities. Third, digital capabilities should be taken as the basis for teacher assessment and evaluation, and be considered in teacher promotion, commendation and other work. This is to encourage teachers to continuously improve their digital literacy, better meet the demands of the digital age, and promote the upgrading and development of vocational education.

3. Develop and Construct Digital Teaching Resources

The development and construction of digital teaching resources is a crucial foundational project in the process of educational digital transformation. It can not only transform abstruse and abstract knowledge into intuitive, visual and interactive high-quality learning materials, breaking the outdated limitation of traditional teaching that "one piece of chalk can solve the world", but also leverage the cloud platform to widely share these high-quality teaching resources. Whether in a bustling city or a remote village, students can obtain rich learning materials. It has effectively promoted the realization of educational equity. The modularly designed resource library grants students the right to independently choose their learning paths, meeting the diverse learning needs of different students and achieving personalized cultivation that is "tailored to each individual". In addition, the construction of digital teaching resources has put forward higher requirements for teachers, compelling them to enhance their digital literacy and promoting the deep integration of teaching content with cutting-edge technologies such as AI and big data, thus laying a solid core support for building a future smart education ecosystem.

Schools should collaborate with industries and enterprises to jointly develop high-quality digital teaching resources, providing flexible and upgradable learning content for cultivating "digital craftsmen". This helps address the problems faced by the educational content of "digital craftsmen", such as overly rapid technological iteration, insufficient cases, and inadequate systematicness and effectiveness. Higher vocational colleges can establish close cooperative relationships with enterprises and jointly develop digital teaching resources through industry-academia cooperation. Enterprises can provide practical application scenarios, equipment, processes, technologies and other application examples to help schools combine theoretical knowledge with practical operations and develop more practical and targeted teaching resources. Schools and enterprises can jointly build a digital teaching resource platform to achieve the co-construction and sharing of resources. Enterprises are mainly responsible for software support and technical guarantee for the platform construction, and at the same time provide a large number of related learning resources. Schools, on the other hand, are mainly responsible for the demand analysis of the resource platform, the division of functional modules, and the construction of specific resource libraries. Schools and enterprises jointly optimize digital knowledge points and skill points, sequence the curriculum system, design knowledge graphs applicable to various majors and professional fields, and develop and improve skill graphs based on occupational groups through school-enterprise cooperation.

The school organized a team to independently develop digital teaching resources. Schools can organize teaching teams to independently develop digital teaching resources based on the teaching syllabus, curriculum standards and teaching plans. These resources can include electronic textbooks, multimedia courseware, micro-lesson videos, teaching cases, etc. Through the approach of project initiation and construction, such as online course projects at the school level, provincial and municipal levels, and national levels, teachers can obtain necessary support and resources to develop and integrate them. At the same time, students can be encouraged to participate in the development of digital teaching resources. For instance, through student projects, internships and practical training, cases and data from actual work can be collected and organized to provide rich materials for the teaching resource library.

Vocational schools fully leverage the intelligent characteristics of digital educational resources, break through the time and space limitations of traditional classrooms, achieve a close integration of theory and practice, adopt an online and offline combined teaching model, integrate knowledge and skills into students' daily lives and internships and practical training, and enhance the effectiveness and applicability of teaching. Vocational schools provide students with deeper and more diversified learning experiences to better adapt to the demands of future career development.

4. Innovate and Optimize the Digital Teaching Model

Innovative digital teaching models in vocational colleges are the core engine for cultivating future technical and skilled talents. By leveraging technologies such as virtual reality and digital twins, the concept of "learning by doing" can be upgraded to "immersive practice", which can address pain points such as the difficulty in training high-risk operations and insufficient equipment. Based on learning analysis technology, a "data-driven" skill development model is constructed to verify the applicability of situational learning theory in the digital age. Vocational schools expand the boundaries of industry-education integration and form a theoretical framework of "school-enterprise digital communities", providing a new paradigm for the theory of vocational education ecosystem.

To promote educational informatization, vocational education needs to continuously optimize its talent cultivation model and accelerate digital transformation and upgrading, in order to cultivate talents with digital capabilities to meet the demands of the digital economy. Vocational schools innovate digital curriculum systems and adopt digital thinking textbooks to ensure that students have abundant digital resources during the learning process. Both theoretical and practical teaching need to integrate digital teaching models. Digital elements should be incorporated into teaching tools such as courseware and lesson plans to comprehensively promote the digitalization process. To strengthen practice-oriented digital teaching, in order to break through the "conceptual walls" and change social concepts, vocational education needs to actively cooperate with enterprises to build digital teaching projects, enhance the digital work process, and take digital practice as the guide to comprehensively improve the cultivation of students' digital capabilities.

In addition, Internet technology can be utilized to transform traditional face-to-face teaching into online teaching. Students can study course content, participate in discussions, submit assignments, etc. through the Internet, achieving remote learning. Virtual reality (VR) or augmented reality (AR) technologies can be utilized to provide students with a simulated experimental environment. Students can conduct experiments in the virtual environment, which can enhance their practical abilities while reducing the cost and risk of experiments. Artificial intelligence technology can be utilized to analyze and predict students' learning situations, providing them with personalized learning plans and guidance, including intelligent recommendation of learning resources and intelligent assessment of learning outcomes, etc. Digital technology can be utilized to simulate real work or life scenarios, enabling students to learn and apply knowledge in the context, thereby enhancing their practical abilities and adaptability. In conclusion, there are various digital teaching models, each with its unique advantages and applicable scenarios. Schools should select the appropriate digital teaching model based on their own actual situation and students' needs, and continuously optimize and improve it.

5. Build a Platform for Integrating Industry and Education to Cultivate "Digital Craftsmen"

The establishment of a platform for integrating industry and education in vocational colleges is a key measure to break the disconnection between talent cultivation and industrial demands. Through the joint construction of training bases by schools and enterprises, the joint development of courses, and the sharing of technical resources, the deep integration of the education chain and the industrial chain is achieved. Enterprises can introduce real projects into the classroom and provide cases of cutting-edge technologies, while schools can customize training programs based on job requirements, making teaching more precisely aligned with industry upgrades. Meanwhile, enterprise mentors participate in practical guidance, providing students with opportunities for "work-study alternation". This not only enhances their skill proficiency but also strengthens their adaptability to the workplace. This two-way empowerment not only increases the employment

matching rate of graduates but also supplies immediate combat readiness talents to enterprises, forming a virtuous cycle of win-win for "schools, enterprises, and students", and injecting lasting impetus into regional industrial upgrading.

At the industry and enterprise level, efforts are made to enhance the innovative level of talent cultivation, increase investment in research and development funds for schools, and continuously promote support for digital research and development in the education sector. Meanwhile, enterprises actively integrate into schools and convey their standards and requirements for talent through various channels such as industrial colleges, apprenticeship training, and expert lectures, to ensure that the school's talent cultivation is more in line with the actual market demands. This strategy focuses on enhancing the flexibility and adaptability of the school's talent cultivation, laying a solid foundation for future technological innovation. At the school level, it is necessary to closely align with the demands of enterprises, conduct in-depth research on the practical needs and difficulties existing in the development of enterprises, strengthen the construction of cooperation channels, and clarify the digital practical needs in the process of enterprise development. Vocational schools adjust their talent cultivation goals in a targeted and dynamic manner and construct corresponding curriculum systems. In addition, in terms of teaching content and practical internships, schools should also formulate forward-looking plans to ensure that the teaching content is perfectly in line with the demands of industries and enterprises. These measures will greatly support schools in better meeting the demands of industry enterprises and cultivating outstanding talents with greater market adaptability. At the professional level, we should actively leverage the aggregating effect of professional resources and continuously promote the integration and structural optimization of resources between schools and enterprises. Vocational schools make full use of digital technology to map out the demand for talents in various industries. Vocational schools conduct in-depth exploration and analysis of the new requirements and connotations in multiple aspects such as national strategic development, industrial upgrading, and local economic construction. On this basis, vocational schools optimize their talent cultivation goals and improve their talent cultivation systems.

6. Improve and Perfect the Evaluation System for "Digital Craftsmen"

Improving the digital evaluation system in vocational colleges is a key lever for enhancing the quality of technical and skilled talent cultivation. Its core value lies in constructing a two-dimensional model of "process evaluation + result evaluation" through data collection and analysis technology, precisely depicting students' mastery of knowledge and proficiency in skills. Vocational schools utilize artificial intelligence algorithms to generate personalized learning maps, helping teachers identify students' "ability gaps" and dynamically adjust teaching strategies. Meanwhile, vocational schools should establish skill certification standards recognized by both the schools and enterprises, so that the assessment results can be directly matched with job demands, thereby enhancing the employment matching degree. This evaluation system not only promotes the transformation of teaching from "experience-driven" to "data-driven", but also provides technical support for building a closed loop of vocational education quality monitoring, facilitating the deepening of the supply-side reform of skilled talents.

Vocational schools design a comprehensive evaluation index system, adopt modern information technology, and integrate the evaluation index system into the teaching cloud platform. Vocational schools comprehensively evaluate students' learning outcomes by recording indicators such as their study duration, learning trajectory, and achievement works. Vocational schools introduce evaluation subjects such as self-evaluation by students, evaluation by teachers, and evaluation by classmates to comprehensively assess learning outcomes. By adopting a multi-faceted evaluation approach that

includes process assessment, summative assessment, and tripartite assessment, and through the smart learning platform, information on students' learning activities is collected to conduct a comprehensive evaluation of the learning process.

In addition, the evaluation process should be optimized. By leveraging technologies such as the Internet of Things and big data, students' learning data should be collected in real time, including their learning progress, homework completion status, and classroom participation. Data processing and analysis should be carried out. Relying on the concept of "learner profiling", all evaluation results of students should be presented comprehensively and intuitively, making the learning process and evaluation results explicit. Through feedback on the evaluation results, Students and teachers can promptly understand their own learning situation and teaching effectiveness, and thus make targeted improvements. Vocational schools implement various digital evaluation methods such as online tests, virtual simulation experiments, project-based learning evaluations, and peer evaluations to comprehensively assess students' learning situations. Vocational schools should strengthen the construction and management of digital assessment systems to ensure their stability, efficiency and security. Vocational schools should enhance teachers' digital evaluation capabilities, improve their digital literacy through training and development, encourage experience sharing, and create a favorable evaluation atmosphere. Through these measures, schools can gradually establish a scientific, efficient and fair digital evaluation method, providing strong support for talent cultivation.

7. Conclusion

In the context of the vigorous development of the digital economy, cultivating "digital craftsmen" that meet its needs has become an important mission of vocational education. This thesis focuses on this key issue and delves deeply into multiple paths to enhance the effectiveness of digital talent cultivation. On the one hand, efforts should be made to enhance the key digital teaching capabilities of vocational schools. Through systematic training, teachers' digital teaching abilities should be improved to enable them to skillfully apply emerging technologies in teaching. Vocational schools actively develop and build digital teaching resources to provide rich and high-quality content support for teaching, innovate and optimize the digital teaching model to stimulate students' interest and initiative in learning. On the other hand, a "Digital craftsman" education platform integrating industry and education should be established. Through the joint construction of training bases by schools and enterprises, the joint development of courses, and the sharing of technical resources, the deep integration of the education chain and the industrial chain can be achieved, promoting in-depth cooperation between schools and enterprises, and enabling students to exercise their practical abilities in real working scenarios. At the same time, a "Digital craftsman" evaluation system should be established and improved to measure the quality of talent cultivation with scientific standards. This thesis aims to provide theoretical guidance and practical basis for the cultivation of digital talents in vocational education under the background of the digital economy, and to contribute to the high-quality development of the digital economy.

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