RESEARCH-ARTICLE

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Abstract

In the new technology wave, the vigorous development of cutting-edge technologies such as big data, cloud computing, and artificial intelligence has made the digital transformation of vocational education an inevitable trend, and the rapid development of new quality productivity has provided strong support for it. This paper focuses on the mechanism of the United Front empowering the digital transformation of vocational education and the coordinated development of new quality productivity. It is found that the United Front relies on resource integration, platform building, collaborative innovation and talent co-cultivation mechanisms to optimize the allocation of vocational education resources, make efficient use of them, and deeply integrate them with innovative technologies, thereby improving the quality and efficiency of education and cultivating a large number of high-quality technical talents. However, there are challenges in the collaborative cooperation of multiple subjects. The different interests and development goals of the government, enterprises, and schools have caused cooperation difficulties. It is necessary to establish an effective communication and coordination mechanism to clarify responsibilities and obligations, strengthen policy guidance and incentives, build a resource sharing platform, promote collaborative innovation, and strengthen talent co-cultivation. Strategies such as these are critical, and can provide specific paths and practical guidance for the digital transformation of vocational education and the coordinated development of new quality productivity, thereby improving the level and competitiveness of national vocational education and promoting high-quality economic and social development.

CCS Concepts

• **Applied computing**; • **Education**; • **Computer-managed instruction**;

Keywords

United Front, Vocational Education, Digital Transformation, New Quality Productivity, Coordinated Development Mechanism

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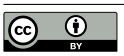

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1 Introduction

Technologies such as artificial intelligence and big data have been spawned by the development of science and technology, deeply reshaping traditional teaching and life and driving industry changes. The digital transformation of vocational education is the only way to adapt to the trend of the times, improve the quality of education, and meet social needs(Zhu and Xiong, 2022). The vigorous rise of new productivity has brought challenges and opportunities to vocational education. It has the characteristics of technological innovation, data-driven, and industrial integration, and has given rise to new talent needs (Zhu et al., 2024). Vocational education urgently needs to accelerate digital transformation to cultivate talents with both innovative and practical abilities. This can effectively promote the deep integration of vocational education and new productivity, make educational content keep pace with the times, innovate and break through educational methods, and help the high-quality development of the economy and society in all aspects(Zhang and Zhu , 2023).

The United Front is an important magic weapon in the process of China's modernization. It has unique political advantages and values in the field of vocational education(Ma, 2024). As an important part of the superstructure, the United Front can shape a stable and united political order and social environment, and have a positive impact on the development and improvement of the economic foundation, including new quality productivity (Xu,Wang&Liu, 2024). It can also play an important role in the digital transformation of vocational education and the coordinated development of new quality productivity. With the help of the power of the United Front, it can mobilize the resources and enthusiasm of all parties to form a strong synergy to promote the digital transformation of vocational education. It can also promote communication and exchanges between vocational education and the industry, promote the integration of production and education, and school-enterprise cooperation, and provide strong support for the digital transformation of vocational education(Shi , 2024).

What is the situation in which the mechanism of the digital transformation of vocational education and the coordinated development of new quality productivity is empowered by the united front? In-depth research on this issue has important theoretical significance and practical value. It will not only help enrich the development of the theoretical system of vocational education, but also provide useful guidance and reference for the reform and practice of vocational education. It will also promote the in-depth application of the united front in the field of vocational education, so that its unique advantages and important role can be further exerted. It will also enable people to better understand and grasp the laws and trends of the digital transformation of vocational education, and provide strong support for the innovative development of vocational education and the comprehensive progress of social economy.

2 Research objectives and problem

This study aims to explain the unique role of the United Front in promoting the digital transformation of vocational education, and further build a mechanism for its coordinated development with new quality productivity. The core issue is how to effectively use the political advantages of the united front to promote the digital transformation of vocational education, thereby boosting the rapid development of new quality productivity.In the process of solving the core problems, this study aims to provide new ideas and paths for the digital transformation. By building a mechanism for the coordinated development of the digital transformation of vocational education and new quality productivity through the united front, it will help improve the quality and efficiency of vocational education, and provide strong talent support and intellectual guarantee for the development of new quality productivity, so as to further promote the sustainable and healthy development of the economy and society(Gu and Chen, 2025). The core purpose of this study is to reveal the enabling role of the united front in the digital transformation and to build a mechanism for its coordinated development with new quality productivity. By solving the core issue of how to use the political advantages of the United Front to promote the digital transformation, this study will provide useful theoretical support and practical guidance for related fields.

The core content of the United Front empowering the digital transformation of vocational education

2.1 The connotation of digital transformation of vocational education

Comprehensively strengthening the application of digital information technology represented by artificial intelligence in the field of vocational education is the digital transformation of vocational education. This is a continuous innovative process guided by value transformation, driven by data elements, and pursuing system change. The purpose of using modern information technology to carry out comprehensive and profound reform and innovation of traditional vocational education is to improve the overall quality and efficiency of education and cultivate high-quality technical and skilled talents that meet the needs of the new era (Gao and Huang , 2023).

During the digital transformation of vocational education, teaching content and means have been digitized from traditional text and pictures to audio, video and even virtual reality, which has enriched teaching methods and learning experience, and the teaching methods have shifted to networking and platformization. By combining online and offline, it breaks the limitations of time and space, improves teaching efficiency and provides a broader development space, and improves the degree of sharing of teaching resources. With the help of technologies such as big data and artificial intelligence, teaching evaluation is made intelligent, which can track learning status in real time and accurately evaluate, providing support for personalized teaching. Digital transformation has injected powerful impetus given by the times into the high-quality development of vocational education. Vocational education methods have become more flexible and diverse, able to meet diversified learning needs, and drive innovations in talent training, system construction, and economic adaptation to promote the high-quality development of vocational education (Qi and Wu , 2024).

2.2 The connotation and characteristics of new quality productivity

New-quality productivity refers to productivity of a new quality. In the context of the new era, it is dominated by scientific and technological innovation, supported by new technologies such as digitalization, networking, and intelligence, and is marked by breakthroughs in key disruptive technologies(Zhou and Xu, 2023). It is an advanced form of productivity that is spawned by strategic emerging industries and future industries. It has the ability to utilize and transform nature in an efficient and high-quality manner, is more in line with the requirements of high-quality development, and better reflects the characteristics of integrated and cross-development(Zhang and Pu, 2023).

New-quality productivity focuses on the leap of workers, labor materials, labor objects and their optimized combination, and has the characteristics of high technology, high efficiency and high quality. It conforms to the new development concept and represents a new stage and advanced form of productivity development (Ren and Dou, 2024).This puts forward higher requirements for the digital transformation of vocational education. Vocational education needs to accelerate reform and innovation in digital transformation to adapt to and lead this historic change. The innovation of new quality productivity lies in subverting and reshaping traditional production methods, using digital technology to accurately control production processes, optimize resource allocation, and quickly respond to market demand. It also attaches importance to the training and introduction of high-quality talents to promote the continuous innovation and development of productivity.

2.3 The role of united front in the digital transformation of vocational education

In the process of digital transformation of vocational education, the United Front has an important significance that cannot be underestimated. It brings together resources from the government, enterprises, schools and other parties to promote the formulation and implementation of policies, and thus gathers a powerful force to promote the digital transformation of vocational education , and like a bridge, it organically integrates the interests and development visions of all parties, providing a solid policy guarantee and material foundation for the transformation (Cheng and Wang, 2024). In deepening the deep integration of vocational education and new quality productivity, the United Front builds a resource sharing platform, promotes collaborative innovation, and carries out activities such as talent co-cultivation to strengthen the connection and interaction between the two and promote coordinated development(Xie and Chen, 2025). With its political and organizational advantages, the United Front creates a good atmosphere and environment for transformation, unites and leads all parties to participate in the development of vocational education, publicizes and promotes advanced educational concepts and technical means, guides all sectors of society to correctly understand and evaluate, and creates favorable external conditions for the healthy development of vocational education.

3 power the digital transformation of vocational education

3.1 Resource integration mechanism

When building a resource integration mechanism, the united front has unique advantages to play with and can widely unite all sectors of society to lay a solid foundation for the digital transformation of vocational education.The government plays a leading and key role. It has to formulate policies to clarify the direction and provide financial support and policy guidance, such as setting up special funds to support infrastructure construction, formulating policies on resource development and integration and teacher training, etc. It uses tax incentives, financial subsidies and other means to encourage corporate participation, so that the government and enterprises can form a good synergy to promote together.Enterprises play an important role in the transformation. Because they have advanced technology and practical experience, they can provide technical support and internship training bases. In the process of school-enterprise cooperation and integration of production and education, enterprises are deeply involved in teaching and jointly develop digital courses with schools, which helps to improve students' skills and enhance their employment competitiveness.

As the implementing body, the teaching quality and management level of the school are very critical. The school must strengthen the construction of the teaching staff, build a compound teaching team to improve digital teaching capabilities and professional qualities, introduce advanced teaching equipment and technical platforms, integrate digital and intelligent technologies to improve teaching conditions, enrich teaching content and methods to provide high-quality learning experience, and strengthen communication and cooperation with the government and enterprises to ensure the correct direction of transformation.The key to the united front empowering transformation lies in the resource integration mechanism. The government, enterprises, schools and other parties work together and cooperate to effectively integrate resources from all parties, form a powerful driving force, and effectively guarantee and support the digital transformation of vocational education.When building the mechanism of resource integration, the united front has unique advantages to play and can unite all sectors of society extensively, laying a solid foundation for the digital transformation of vocational education.

3.2 Platform construction mechanism

As the key underlying technical support for the United Front to empower the digital transformation of vocational education, the platform building mechanism and carefully constructed platform building can achieve effective integration and sharing of resource sharing platforms, thereby optimizing the allocation and efficient utilization of vocational education resources, and accelerating the transformation of vocational education to modern digitalization.

The core of the platform mechanism system is the online teaching platform, which uses modern digital, networked, intelligent and other information technologies to integrate online courses, real-time teacher-student interaction, learning effect evaluation and tracking and other functions. This platform can provide high-quality and rich teaching resources and diverse teaching methods,

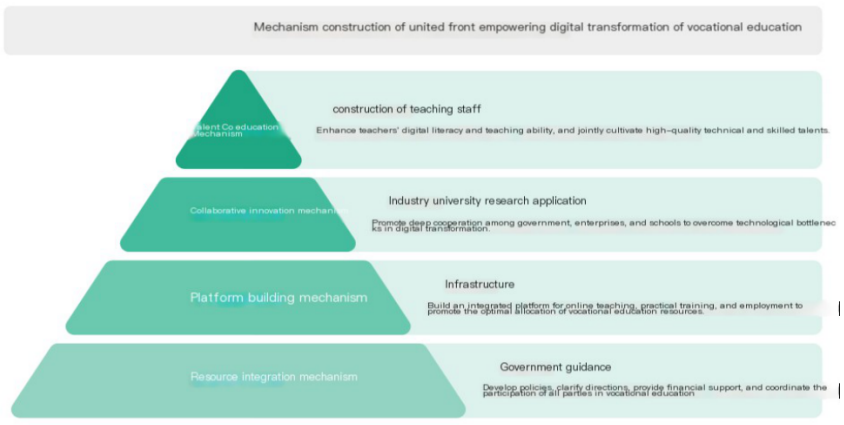

Figure 1: The framework for constructing the mechanism of the United Front in empowering the digital transformation of vocational education

which not only enables instant communication between teachers and students, improves teaching effects and learning experience, but also radiates high-quality educational resources to a wider area, thereby narrowing the regional gap in educational resources and promoting educational equity.Vocational education is highly practical and requires high skills, so a virtual simulation training platform came into being. It can use virtual simulation technology to allow students to practice in a safe and controllable environment, thereby improving their practical ability and professional quality, and can also reduce training costs and improve the efficiency of educational resource utilization.

In the employment service mechanism, the importance of the employment service platform cannot be underestimated. It can provide students with one-stop services such as career planning, employment guidance, recruitment information, etc., and work closely with enterprises and industries to accurately connect with market demand and industry trends, provide accurate employment information, and collect student employment feedback and corporate employment needs, providing strong guidance for the continuous improvement of vocational education.

3.3 Collaborative innovation mechanism

When the united front empowers the digital transformation of vocational education, the collaborative innovation mechanism is of great significance. For this mechanism to operate effectively, it depends on the in-depth participation and collaborative cooperation of multiple parties such as the government, enterprises, and schools to jointly respond to and solve the technical and bottleneck problems encountered in the digital transformation of vocational education.

During collaborative innovation, the government plays a guiding and supporting role, formulates relevant policies, provides guidance for the digital transformation of vocational education, provides institutional guarantees, and uses financial investment and project support to promote the establishment of a cooperation mechanism between industry, academia, research and application, thereby facilitating the transformation and application of scientific research results.

Enterprises that are market economic entities have the advantages of rich technical resources and practical experience. In the collaborative innovation mechanism, enterprises actively participate in the digital transformation of vocational education. Enterprises and schools jointly carry out activities such as technology research and development, talent training, etc. The participation of enterprises has brought new vitality to the digital transformation of vocational education and enabled the in-depth development of models such as integration of production and education, and school-enterprise cooperation.

Schools are the cradle of talent cultivation. They shoulder the important task of cultivating high-quality talents that adapt to the development of new productivity(Chu , 2024). In the collaborative innovation mechanism, schools should give full play to their own advantages, strengthen the construction of teaching staff, improve teaching quality and management level, and actively cooperate with enterprises and governments to explore new paths and models for the digital transformation of vocational education.

After the construction and implementation of the collaborative innovation mechanism, the united front will closely link up multiple parties such as the government, enterprises, and schools to form a good ecology, realize resource sharing, complementary advantages, and collaborative innovation. This ecology will help overcome the technical difficulties and bottlenecks in the digital transformation of vocational education, and promote the deep integration and coordinated development of vocational education and new quality productivity.

3.4 Talent co-cultivation mechanism

The core link of the talent co-cultivation mechanism is the construction of the teaching staff. During this period, we should not only focus on improving teachers' digital technology literacy, enable them to master modern information digitization and intelligent technology and effectively apply new technologies to the teaching process,

but also pay attention to the improvement of teachers' teaching abilities to ensure that they meet the new requirements of the digital teaching environment. We can regularly organize digital teaching skills training, invite industry experts to lectures and exchanges, etc., to give teachers continuous learning and growth opportunities.An important implementation path for the talent co-cultivation mechanism is school-enterprise cooperation and the integration of industry and education. By deepening school-enterprise cooperation, schools can introduce advanced technologies and practical training resources from enterprises, providing students with a practical environment that is closer to actual work scenarios. Moreover, the integration of industry and education is conducive to closely linking teaching with industry needs, ensuring that the talents cultivated are in line with the latest development trends in the industry. Projects such as jointly building training bases and carrying out order-based training can promote the deep integration of schools and enterprises.

4 Analysis of difficulties in empowering the digital transformation of vocational education by the united front

4.1 Difficulties in multi-agent collaboration

The digital transformation of vocational education is empowered by the united front, and the main difficulty of multi-subject collaboration cannot be ignored. Although the government, enterprises, schools and other parties have common goals in promoting the digital transformation of vocational education, their respective interests and development goals are different. Such differences make collaboration complex and subtle.

The public interest is represented by the government. The government focuses on ways to improve the education level and quality of talent training in the whole society through the digital transformation of vocational education. When formulating relevant policies and investing resources, it considers more from the overall and long-term perspectives. However, when enterprises participate in the digital transformation of vocational education, they often pay more attention to short-term economic benefits and technological research and development results, while schools care more about improving teaching quality, expanding enrollment scale and increasing student employment rate.

The various parties have different interests and development goals, which makes it easy for friction and disagreement to arise during collaboration. To solve these problems in collaboration, it is necessary to establish an effective communication and coordination mechanism, such as a regular communication meeting mechanism, an information sharing platform mechanism, a problem tracking and resolution mechanism, etc. Only in this way can the parties be aware of each other's needs and concerns in a timely manner and work together to find solutions. It is also critical to clarify the responsibilities and obligations of all parties. The government, enterprises and schools should clarify their respective responsibilities and expected results at the beginning of the cooperation to avoid buck-passing and reduce conflicts. Policy guidance and incentives are indispensable.

To promote the united front to empower the digital transformation of vocational education, collaborative cooperation among multiple subjects is the key link. To enable all parties to win-win in cooperation and jointly promote the smooth implementation of the digital transformation of vocational education, it is necessary to establish an effective communication and coordination mechanism, clarify the responsibilities and obligations of all parties, and strengthen policy guidance and incentives.

4.2 Effect evaluation and feedback optimization

When evaluating the effects, it is necessary to ensure that the selected indicators are scientific and practical. The actual effect of the digital transformation of vocational education can be evaluated through multi-dimensional data such as student satisfaction surveys, graduate employment rates, and employer feedback. Big data and artificial intelligence technologies can also be used to analyze student learning behaviors, changes in grades, etc., so as to more accurately evaluate the impact of digital transformation on student learning outcomes.

In addition to scientific evaluation indicators, it is also extremely important to establish an effective feedback optimization mechanism that can timely collect, analyze, and process evaluation results, so as to quickly identify existing problems and deficiencies, and take corresponding improvement measures immediately after discovering problems to ensure the continued healthy advancement of the digital transformation of vocational education.

5 Research conclusions and contributions

This study clarifies the core role of the united front in the digital transformation of vocational education. The united front can effectively promote the digital transformation of vocational education and the coordinated development of new quality productivity by relying on mechanisms such as resource integration, platform building, collaborative innovation, and talent cultivation.This study deeply analyzes the difficult problems faced by the united front in empowering the digital transformation of vocational education, such as the complexity of multi-subject collaborative cooperation, the importance of effect evaluation and feedback optimization, and other issues are revealed one by one. In response to these difficult problems, this study provides a series of feasible solutions and suggestions. Measures such as strengthening communication and collaboration among governments, enterprises, schools, etc., establishing a flexible and adjustable mechanism system, and improving effect evaluation and feedback optimization mechanisms can effectively solve the difficulties and challenges in the process of the united front empowering the digital transformation of vocational education. These solutions and suggestions provide useful references for the formulation and implementation of relevant policies and provide strong support for the practical exploration of the digital transformation of vocational education.This research has achieved remarkable results in theory and practice, and has made great contributions to the digital transformation of vocational education and the coordinated development of new quality productivity. In the future, we will continue to pay attention to the latest developments and trends in this field, and contribute more wisdom and strength to promoting vocational education reform and industrial upgrading.

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