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"Three-education" Synergistic Innovation Driven by New Quality Productive Forces: Connotation Deconstruction, Logical Deduction and Path Exploration

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Abstract

The new quality productive forces led by science and technology innovation is reshaping the global economic and social structure, with far-reaching impacts on the field of education. In this context, "three-education" collaborative innovation has become a key force to promote the modernization of education. The new quality productive forces will optimize the allocation of educational resources through scientific and technological means, promote the transformation of the education model and conceptual innovation, and lead the education system to deep-level changes. In this change, technological innovation and educational innovation are mutually empowering, emphasizing the core role of interdisciplinary integration and open cooperation in building a new era of educational ecology. To cope with this trend, the "three educators" collaborative innovation should build a smart education platform, implement cross-border integration education strategies, establish an ecosystem for industry-education integration, build an open resource symbiosis network, and innovate the education evaluation system. These strategies are aimed at cultivating high-quality talents that meet the needs of the new era and providing solid human and intellectual support for high-quality economic and social development.

Keywords: New Quality Productive Forces, vocational education, higher education, continuing education, industry-education integration, collaborative innovation

1. Introduction

In the wave of technological innovation, the rise of New Quality Productive Forces is reshaping the global industrial landscape in an almost silent way. The field of education, as the cornerstone of a nation's progress and a strategic driving force, shoulders the important task of cultivating talents adapted to current developments. In the face of this challenge, the education system must keep pace with the times and provide solid talent and intellectual support for the country's innovation-driven development through unremitting innovation and deep integration.

For example, the introduction of policies such as China Education Modernization 2035 has pointed the way for China to build a modern education system for lifelong learning for all. Under the leadership of the new productivity, the synergistic innovation of vocational education, higher education and continuing education (hereinafter referred to as the "three educations") is particularly crucial. This is not only a comprehensive innovation of the education system, but also a fundamental reshaping of the allocation of education resources, education models and education concepts.

In view of this, on the basis of exploring the intrinsic connection between the New Quality Productive Forces and the "three-education" collaborative innovation, this paper will reveal the concrete embodiment and potential application of the New Quality Productive Forces in the field of education through in-depth theoretical analysis and academic dialogues. Then, the connotation of "three-education" synergistic innovation is carefully deconstructed and its inner logic is rigorously interpreted. On this basis, we will further explore the effective path to realize the synergistic innovation of "three educations", aiming to contribute wisdom and strength to the new era of education under the leadership of the New Quality Productive Forces.

2. Theoretical Exploration and Academic Dialogue: Trajectories of Educational Innovation Under the New Quality Productive Forces

2.1 Educational Mapping of New Quality Productive Forces: Theoretical Explanations and Multiple Application Scenarios

The New Quality Productive Forces, as an advanced form centered on scientific and technological innovation and deeply integrating the traditional productivity, is profoundly changing the way of production and service, and putting forward new requirements and expectations for the field of education. In this context, the role and mission of education are being redefined, and its practical application under the guidance of the theory of New Quality Productive Forces is particularly important.

First of all, the theoretical interpretation of New Quality Productive Forces in the field of pedagogy emphasizes the leading role of scientific and technological innovation in educational innovation. This theory not only promotes the intelligent sharing and efficient allocation of educational resources, but also promotes the innovative transformation of the education model and the renewal of the education concept. This means that education will be more focused on cultivating students' innovative, practical and lifelong learning abilities to meet the diversified and specialized needs of economic and social development. Pu Qingping and Xiangxiang (2024) discuss the role of new kinetic energy in promoting Chinese-style modernization from the connotative characteristics of New Quality Productive Forces, which provides new perspectives and theoretical support for innovation in the field of education (Pu & Xiang, 2024).

In terms of application scenarios, the education mapping of New Quality Productive Forces shows diversified features. On the one hand, in the construction of the intelligent education platform, with the help of big data, artificial intelligence and other advanced technologies, the New Quality Productive Forces realizes the intelligent management and personalized push of educational resources, which will provide students with a more efficient and convenient learning experience. On the other hand, in the implementation of the cross-border integration education strategy, New Quality Productive Forces will promote the cross-fertilization of different disciplines, promote cross-penetration and innovative development of knowledge, and provide students with broader academic horizons and innovative space.

In addition, the educational mapping of New Quality Productive Forces is also reflected in the construction of the ecosystem of industry-education integration. By strengthening close cooperation with industry, the education system can keep abreast of the latest developments and needs of industrial development and provide a steady stream of technical and skilled talents to support industrial development. Li Zheng and Liao Xiaodong (2023) discussed the generative logic and original value of the New Quality Productive Forces theory, emphasized its role in promoting the in-depth integration of education and industry, and pointed out that it helps to form a new pattern of the synergistic development of education and industry (Li & Liao, 2023).

2.2 The Theoretical Genealogy of the "Three Teachings" Collaborative Innovation: Historical Evolution and In-depth Academic Discussions

The theoretical genealogy of "three-education" synergistic innovation is like a magnificent historical scroll, which not only reveals its profound theoretical underpinnings, but also outlines its developmental vein as it advances with the times. The formation and development of this theory is a courageous breakthrough from the traditional education model, as well as a profound response to and active exploration of the development of education in the new era.

From a historical point of view, the concept of "three-education" collaborative innovation has gone through a long process from initial proposal to gradual deepening, from theoretical discussion to practical exploration. Guo Wenfu (2023) pointed out that since the founding of New China, the relationship between vocational education, higher education and continuing education has gone through a stage of development from relative independence to communication and articulation, and then to coordination and harmonization (Guo, 2023). During this process, educators and scholars have provided rich practical experience and solid theoretical support for the development of the theory of "three-education" collaborative innovation through continuous practice, summarization and innovation.

Academics have also carried out in-depth discussions and debates on the theoretical genealogy of "three-education" collaborative innovation. Through theoretical analysis, Wang Ying et al. (2022) put forward the practical points of vocational education, higher education and continuing education, and emphasized the trend of integration between the three (Wang, Gao, Li & Wang, 2022). Huang, Bizhu and Chen, Ruijing (2023) further discussed the practical way forward for the collaborative innovation and development of "three

education" empowered by digital intelligence, emphasizing the importance of openness and tolerance, integration and transformation, sharing and complementation, intelligent governance and organizational safeguard (Huang & Chen, 2023). Xie Hao et al. (2024) clarified the basis of the policy of "three-education" synergy, and put forward specific policy directions to solve the urgent problems, realize the complementary advantages and innovate the institutional mechanism (Xie, Zhao, Yang & Li, 2024). Ma Shuchao and Guo Wenfu (2023) emphasized that to promote the coordinated development and collaborative innovation of the "three religions", it is necessary to adhere to the right and innovative approach, explore the road of coordinated development of the "three religions" in Chinese style, adhere to the systematic thinking, strengthen the coordinating role of the government, and adhere to the problem-oriented approach to speed up the solution of bottlenecks. At the same time, we should adhere to the problem-oriented approach and accelerate the solution of bottlenecks (Ma & Guo, 2023).

These academic debates not only promote the continuous improvement and development of the theory of "three-teaching" collaborative innovation, but also provide more scientific and rational guidance for educational practice. In this process, it is not difficult to find that the theoretical spectrum of "Three Teachings" synergistic innovation does not exist in isolation, but is closely connected with the background of the times, social development and educational practice. It is both a product of the times and an inevitable requirement of educational development.

2.3 Gaps in the Research Frontiers: "Tri-teaching" Collaborative Innovation From the Perspective of New Quality Productive Forces

With the rapid development of new productivity, the education system is facing unprecedented challenges and opportunities. In this context, Cui Xinyou (2023) pointed out that the collaborative innovation of "three educations" is the proposition of the times to accelerate the construction of a high-quality education system, and it is also the way to build a learning society and a learning country (Cui, 2023). The rise of New Quality Productive Forces requires the establishment of a closer and closer cooperation relationship among the "three educations" in order to realize the sharing of resources, complement each other's strengths, and jointly respond to the challenges of industrial demand and technological change.

However, in the current context of rapid social and technological development, there are still gaps in the research on "three-education" co-innovation. Although there are some research results, the in-depth exploration of the relationship between the new quality of productivity and "three-education" collaborative innovation is still insufficient, and the research on the specific implementation paths and evaluation of the effects has not yet reached the desired depth. Chen Fengying's (2023) study reveals that the current cognitive, structural and institutional dilemmas in the development of "three-education" collaborative innovation are in stark contrast to the rapid progress of new productivity (Chen, 2023).

In order to fill these research gaps, it is necessary to further expand the field of research, while emphasizing interdisciplinary research methods and perspectives. Future research should be more comprehensive and in-depth to reveal the mechanism and path of "three-education" collaborative innovation under the perspective of New Quality Productive Forces. The study of Zhou Fenghua et al. (2024) emphasizes the importance of accelerating the establishment and improvement of the mechanism, mode and path of coordinated innovation of the three religions for the modernization of education (Zhou, Du & Li, 2024), which points out the direction for future research.

It is crucial to construct a theoretical framework for the study of "three-education" synergistic innovation from the perspective of New Quality Productive Forces. The framework can be considered from the following dimensions: first, to clarify the connotation and characteristics of the new quality of productivity, and analyze its far-reaching impact on the field of education; second, to analyze the internal logic and mechanism of the "three-education" collaborative innovation, and to understand the core elements of its functioning; third, to explore the interaction between the new quality of productivity and Secondly, to explore the interaction between new quality productive forces and "three-education" collaborative innovation, as well as the specific application of this interaction in educational practice; finally, to put forward targeted policy recommendations and practical paths to promote the deep integration of new quality productive forces and "three-education" collaborative innovation. Through the construction of this theoretical framework, we aim to provide valuable reference and guidance for future research and practice. The specific concept is shown in Figure 1.

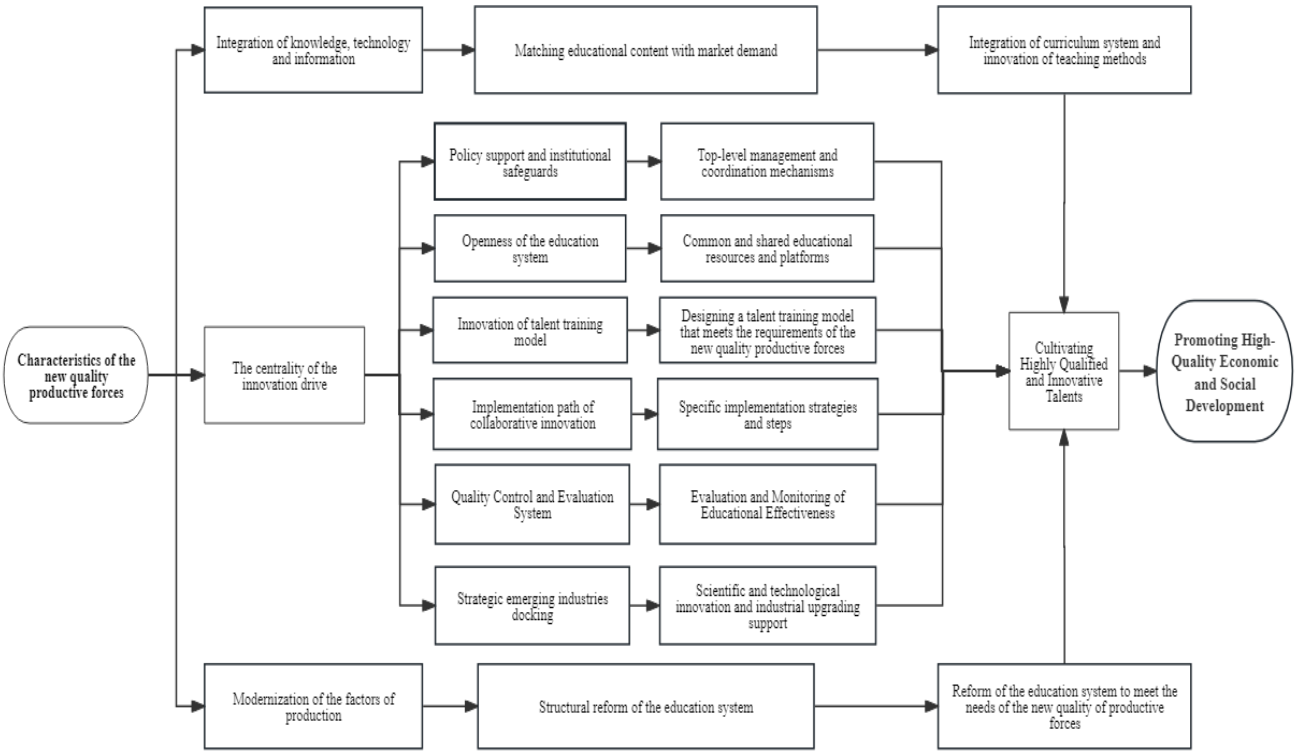

Figure 1. Theoretical framework for the promotion of "tri-education" synergistic innovation by the New Quality Productive Forces

3. In-depth Deconstruction of the Connotation of "Three-education" Collaborative Innovation Driven by New Quality Productive Forces

3.1 Sharing and Optimization of Educational Resources: Innovations in the allocation of Educational Assets for New Quality Productive Forces

In the wave of New Quality Productive Forces, the sharing and optimization of educational resources have become the core driving force for innovation in the allocation of educational assets. With the rapid development of information technology, the trend of digitalization, networking and intelligence of educational resources has become more and more significant, providing solid technical support and extensive social demand for educational resource sharing. Bie Dunrong and Shao Jianyao (2024) profoundly pointed out that the synchronous resonance of economy and education has laid a solid social cornerstone for the collaborative and innovative development of education (Bie & Shao, 2024). The dimension of educational resource sharing is rich and diversified, not only covering the sharing of teaching content, teaching methods and educational technology, but also involving the comprehensive exchange of educational concepts, educational goals and educational evaluation systems. Through the sharing of resources, educational resources can be maximized and the efficiency of their use can be enhanced, thus promoting educational equity and improving the quality of education.

At the same time, the sharing of educational resources is also an important means of optimizing the allocation of educational assets. It can break down geographical and institutional boundaries and achieve balanced allocation and efficient utilization of educational resources. In order to achieve this goal, it is necessary to build an open and shared mechanism for sharing educational resources, and to promote the interconnection of educational information and the open sharing of educational data. He Qiaoqiao (2024) emphasized that coordinating vocational education, higher education, and continuing education synergistic innovation is of inestimable value for promoting education modernization and adapting to industrial changes (He, 2024). In addition, strengthening the integration and management of educational assets, optimizing the structure of educational asset allocation, and enhancing the efficiency of using educational assets are likewise non-negligible aspects. Yin Ximing et al.

(2024) provide a practical and feasible practical path for educational resource sharing through an in-depth study of the new mechanism of market-oriented allocation of data elements, and emphasize the importance of the ecology of multiple subjects building together (Yin, Chen & Wang, 2024).

The development of New Quality Productive Forces has put forward new challenges and requirements for the sharing and optimization of educational resources. The education system needs to keep pace with the times and constantly explore and innovate the mode and mechanism of educational resource sharing to meet the urgent needs of the development of New Quality Productive Forces. The sharing and optimization of educational resources is not only an important part of the innovation of educational asset allocation, but also a necessary way to promote the modernization of education and achieve high-quality development of education. Xie Qingsong et al. (2024) proposed the implementation of flexible academic system and full credit system based on digital technology, which provides new perspectives and practical paths for the construction of the foundation of the articulation and coherence of the "three education" and points out the direction for the research (Xie, Li & Zhang, 2024).

3.2 Innovation and Transformation of Educational Models: Evolution of the Educational Paradigm Led by the New Quality of Productivity

Driven by the new quality of productive forces, the traditional education model, which relies excessively on teachers, classrooms and textbooks, has gradually become difficult to adapt to the rapid changes in social development. The education model needs to realize the change from "teacher-centered" to "student-centered", from "classroom-centered" to "learning-centered", and from "textbook-centered" to "competence-centered". from "teacher-centered" to "student-centered", from "classroom-centered" to "learning-centered", and from "textbook-centered" to "competence-centered". Xu Zheng et al. (2024) emphasized the importance of New Quality Productive Forces for expanding domestic demand and deepening the supply-side structural reform under the vision of new development pattern, and advocated the construction of an innovation-centered education system, which provides solid theoretical support for the innovation and transformation of the education model (Xu & Zhang, 2024).

The innovation and transformation of the education model needs to make full use of the technological innovations and resource advantages brought about by the new quality of productivity. The rapid development of information technology, the Internet, big data, artificial intelligence and other emerging technologies has provided unlimited possibilities for innovation in the education model. With the help of these advanced technologies, the digitalization, networking and intelligence of educational content can be realized, thus enhancing the interactivity, flexibility and personalization of education. Song Yafeng et al. (2023) conducted an in-depth discussion on the strategic significance, theoretical connotation and practical path of collaborative innovation of vocational education, higher education and continuing education, which provides valuable theoretical resources and practical guidance for the innovation of education model (Song, Yan & Sun, 2023). In addition, based on the perspective of general system structure theory, Wang Qilong (2023) proposed a mechanism to optimize the integrated and coordinated development of the "three educations", which provides a systematic thinking path for the transformation of the education model (Wang, 2023).

The innovation and transformation of the education model is not only an inevitable trend in the evolution of the education paradigm, but also the key to promoting the modernization of education and realizing the high-quality development of education. By deepening the reform of the education model, we can better meet the personalized learning needs of students, improve the quality and effectiveness of education, and cultivate more innovative, complex and applied talents who meet the needs of the development of the New Quality Productive Forces. This will inject a steady stream of vitality into the continued progress and prosperity of society.

3.3 Renewal and Upgrading of Educational Concepts: The Evolution of Educational Thinking as a Result of the New Quality of Productivity

The rapid development of new quality productive forces has also raised brand-new challenges and expectations for the innovation and sublimation of educational concepts. The traditional education concept which is centered on knowledge transmission and oriented on examination results has been gradually difficult to adapt to the needs of social development. Therefore, the concept of education needs to realize the transformation from mainly knowledge transmission to mainly ability cultivation, from examination result orientation to comprehensive quality orientation, and from school education to lifelong learning. Such a change requires the education system to keep pace with the times and to constantly innovate its educational theories in order to meet the urgent needs of the development of the new quality of productive forces.

The research of Zhang Shanchao and Xiong Letian (2024) shows that the cultivation of top innovative talents is

the key to realize original innovation (Zhang & Xiong, 2024), which highlights the importance of the innovation of education concept. The innovation and sublimation of educational concepts need to be closely centered on the core elements and internal requirements of the development of New Quality Productive Forces. With the continuous progress of the new quality of productive forces, the comprehensive quality of talents, such as innovation ability, practical ability, collaboration ability and learning ability, has put forward higher requirements. Therefore, the concept of education needs to keep pace with the times, with innovation, practice, collaboration and learning as the core, to cultivate high-quality talents who can adapt to the needs of the development of New Quality Productive Forces.

In addition, in order to realize the renewal and sublimation of the concept of education, the content of education, educational methods and the educational evaluation system also need to be comprehensively reformed and innovated. The reform of educational content should closely focus on the characteristics of the development of the New Quality Productive Forces, emphasizing the cultivation of the spirit of innovation, practical ability and comprehensive quality. Innovation in education methods, on the other hand, can make use of information technology, the Internet, big data, artificial intelligence and other emerging technologies to inject more interactive, flexible and personalized elements into education. The reform of the education evaluation system, on the other hand, should be competence-oriented, comprehensively evaluating the comprehensive quality of students and promoting their all-round development.

The discussion between Liu Navy and Zhai Yun (2024) reveals the new requirements of the New Quality Productive Forces in the digital era on the concept of education, and jointly promotes the innovation and sublimation of the concept of education through the paths of improving the digital literacy of the whole population, enhancing the ability of scientific and technological innovation, activating the potential of data elements, and bringing together the advantages of the fusion of digital and real (Liu & Zhai, 2024). This process is not only an inevitable trend in the evolution of educational thinking, but also the key to promoting the modernization of education and achieving high-quality development of education. Through the innovation and sublimation of education concepts, the education system can better adapt to the development requirements of the new quality of productive forces, cultivate more innovative, complex and application-oriented talents, and provide a solid talent guarantee and intellectual support for economic and social development.

4. Precise Deduction of the Logic of "Three-education" Collaborative Innovation Driven by the New Quality of Productivity

4.1 Technological Innovation and Educational Innovation: Interactive Enabling Mechanisms for New Quality Productive Forces

In the wave of New Quality Productive Forces, technological innovation and educational innovation are like a pair of dancers dancing together, forming a close and dynamic interaction and empowerment mechanism. Technological innovation, as the core engine of the new quality of productivity, continuously pushes educational innovation to new heights. Educational innovation, on the other hand, provides technological innovation with a steady flow of talents and intellectual nourishment in its unique way, and together they construct an ecosystem of mutual promotion and synergistic development.

As Guo Yifeng and Gao Ke (2024) insight, the rise of New Quality Productive Forces is profoundly changing the endowment of human resources and the structure of the labor force, which brings unprecedented challenges and opportunities for the cultivation of technical and skilled talents (Guo & Gao, 2024). In this context, breakthroughs in cutting-edge technologies such as cloud computing, big data, and artificial intelligence have provided solid technical support for innovative education models such as online education, intelligent teaching, and personalized learning. These emerging education modes break the time and space boundaries of traditional education, greatly improve the efficiency and quality of education, and enable the extensive sharing of quality education resources on a global scale.

Zhang Zhanbin's (2024) study further pointed out that the development of New Quality Productive Forces requires fully tapping the potential of data elements and promoting regional collaborative innovation, which provides a strong technical support and power source for educational innovation (Zhang, 2024). At the same time, educational innovation also puts forward higher expectations and requirements for technological innovation, calling for the emergence of more intelligent and humanized learning platforms as well as more accurate and efficient learning data analysis tools. This two-way demand and supply is continuously promoting the deep integration and synergistic development of technological innovation and educational innovation.

In this process, the innovation and transformation of the education model is particularly important. The traditional teacher-centered teaching model is gradually being transformed into a student-centered learning

model that encourages students to become active explorers of knowledge and active problem solvers. At the same time, technological innovations have facilitated the flourishing development of Open Educational Resources (OER), opening up new paths for the improvement of educational equity and quality. Although the study by Shiping Mao and Chen Zhang (2024) focuses on the development of New Quality Productive Forces in agriculture, its core concept is also applicable to the field of education, i.e., educational innovation plays a pivotal role in promoting social progress (Mao & Zhang, 2024).

4.2 Disciplinary Integration and Educational Symbiosis: Integrative Parenting Strategies for New Quality Productive Forces

The dynamic development of the new quality of productive forces has placed new demands on the education system for the training of human resources, that is, the training of comprehensive human resources capable of adapting to a rapidly changing society. This shift has prompted the education model to move gradually from traditional single-subject teaching to a new stage of interdisciplinary integration, and has emphasized educational symbiosis, i.e., the close connection and synergistic development of the various elements within the education system.

Disciplinary integration, as a way of integrating knowledge across fields, is increasingly becoming a key driver of educational innovation. Under the wave of New Quality Productive Forces, disciplinary fusion occurs not only between natural sciences and engineering technology, but also permeates social sciences and humanities. This fusion breaks the boundaries of traditional disciplines, realizes the complementarity of knowledge and the collision of thinking, and provides a constant impetus for innovation. For example, STEM education is precisely through the integration of multiple disciplines, such as science, technology, engineering and mathematics, to cultivate students' interdisciplinary thinking and practical ability, thus laying a solid foundation for their future career development and social adaptation. Zhang Jiao-yu and Xu Zheng's (2024) study profoundly reveals the comprehensive and hierarchical nature of the New Quality Productive Forces in the perspective of Chinese-style modernization, and emphasizes the need for the education system to cultivate talents with multidisciplinary backgrounds and practical abilities (Zhang & Xu, 2024).

Educational symbiosis, on the other hand, emphasizes close cooperation among schools, enterprises, the Government and society to build a pluralistic, open and shared educational ecosystem. This cooperative model not only provides students with richer and more diverse learning resources and practical opportunities, but also helps them better integrate into society and prepare for their future careers. Li Linbai and Li Beiwei (2024) similarly emphasize the importance of educational symbiosis, i.e., promoting the development of regional education through the integration and sharing of educational resources, when discussing how the Northeast region can achieve comprehensive revitalization by fostering new-quality productive forces (Li & Li, 2024).

In order to effectively implement the integrated parenting strategy of disciplinary integration and educational symbiosis, educators need to constantly update their educational concepts, explore innovative educational models, and reform educational content and methods. At the same time, support at the policy level, guarantee at the institutional level and recognition at the social level are also needed. The government should introduce relevant policies to encourage the practice of interdisciplinary integration and educational symbiosis; schools should establish corresponding mechanisms to incentivize teachers and students to actively participate in interdisciplinary programs and educational symbiosis activities; and the society should create a cultural atmosphere of respect for knowledge and encouragement of innovation to provide a favorable external environment for interdisciplinary integration and educational symbiosis.

4.3 Cooperative Ecology and Educational Win-win: A Symbiotic Development Path for New Quality Productive Forces

In the wave of New Quality Productive Forces, the development of education increasingly highlights the importance of cooperation among multiple subjects. The construction of cooperative ecology and the pursuit of educational win-win have become the core path of symbiotic development under the New Quality Productive Forces. As Li Yuqian (2023) explains, the logic and path of construction of industry-industry-education integration community highlights its key role in promoting the high-quality development of the industry (Li, 2023), which is highly compatible with the concept of cooperative ecology advocated by the New Quality Productive Forces.

The ecology of cooperation is a network of educational cooperation woven by multiple actors such as the government, schools, enterprises and society. In this network, all parties work together to achieve educational goals and promote the vigorous development of education by sharing resources and complementing each other's strengths. Shi Jianxun and Xu Ling (2024) pointed out that in order to accelerate the formation of New Quality

Productive Forces, it is necessary to build a matching science and technology innovation system and institutional environment, which is the inevitable result of close cooperation among multiple subjects (Shi & Xu, 2024).

Win-win situation in education is reflected in the ideal state of cooperation ecology, in which each subject realizes its own educational goals, meets its own educational needs and obtains its own educational benefits through collaboration. In order to achieve win-win education, it is necessary to establish a smooth communication channel between the subjects, coordinate their educational goals and interests, and ensure that all parties maximize the value of the educational process.

The symbiotic development path of cooperative ecology and win-win education requires educators to uphold the educational concept of win-win cooperation, constantly innovate the mode of educational cooperation and optimize the mechanism of educational cooperation. At the same time, policy guidance, institutional safeguards and cultural support are also indispensable to create a favorable atmosphere that respects cooperation and encourages win-win cooperation. In addition, we should also strengthen the evaluation of the effectiveness of the implementation of the cooperative ecology and win-win strategy in education to ensure that this strategy can truly promote the high-quality development of education.

5. Exploration of the Path of Collaborative Innovation of "Three Education" Driven by New Quality Productive Forces

5.1 Intelligent Education Platform Construction: Intelligent Education Innovation Engine for New Quality Productive Forces

In the wave of the new era of digitization and intelligence, the construction of a smart education platform has become the core force leading education innovation and improving education quality. The construction of this platform not only represents the intelligent embodiment of the New Quality Productive Forces, but also is an important cornerstone for the intelligent upgrading of the education field. As stated by Gao Fan (2024), the formation of New Quality Productive Forces cannot be separated from the "three forces" of industry: the force of industrial form reconstruction, the force of industrial structure reshaping, and the force of industrial leap support, and the construction of the intelligent education platform is the vivid practice of this concept in the field of education (Gao, 2024). Zhang Liying and Zhang Xuejun (2024) also emphasized that in the digital era, the reform of the "Three Teachings" in higher vocational colleges and universities needs to be closely in line with the needs of the times, which coincides with the purpose of the construction of the intelligent education platform (Zhang & Zhang, 2024).

The construction of a smart education platform should be deeply rooted in modern cutting-edge technologies such as cloud computing, big data and artificial intelligence. Through cloud computing technology, the platform is able to centrally store and share all kinds of educational resources, providing teachers and students with rich and diverse, convenient and efficient learning materials and teaching tools. The application of big data technology will enable the platform to accurately capture and analyze students' learning behaviors and needs, providing strong support for personalized learning. The integration of artificial intelligence technology will make the intelligent education platform have advanced functions such as intelligent recommendation, intelligent Q&A and intelligent evaluation, which will greatly enhance the intelligence and precision of education and teaching.

Compared with traditional information platforms, the excellence of the smart education platform is not only reflected in the rapid delivery of information, but also in its deep excavation of the depth and breadth of education. This platform is like a huge educational resource library, which can intelligently screen and recommend the most suitable educational content according to the needs and interests of each user, realizing personalized learning in the true sense. At the same time, its powerful interactivity and real-time, so that learning becomes lively and interesting, the communication between teachers and students is more convenient, and the learning experience is greatly improved.

The smart education platform is undoubtedly a force to be reckoned with in promoting educational innovation. It will break the geographical and time constraints by integrating and sharing various educational resources, enabling quality educational resources to be widely disseminated and utilized. At the same time, it also encourages educators and students to try new teaching modes and learning methods, and promotes the continuous updating and progress of educational concepts. The smart education platform not only stimulates students' enthusiasm for learning, but also improves their innovative ability and comprehensive quality, opening up a new path for the future development of education.

However, the construction of smart education platforms also faces a series of challenges. Ensuring the security and stability of the platform, protecting user privacy and data security, and promoting the wide application of the

platform are all challenges that need to be focused on and solved during the R&D process. Therefore, during the R&D process of the platform, attention should be paid to the improvement of capabilities in technological innovation, data management, and privacy protection, as well as the user experience to ensure that the platform can meet the needs of various users. Only in this way can the smart education platform truly become an important support for promoting the development of education.

5.2 Cross-border Integration of Educational Strategies: A Model of Innovative Educational Integration Arising From the New Quality of Productivity

With the rise of new productive forces, the cross-border integration of education strategies among the "three religions" is gradually becoming a new paradigm for educational innovation. This strategy not only breaks the boundaries of traditional education, but also closely links different types of education, and jointly promotes the progress of education. The cutting-edge technology, innovative concepts and cross-border cooperation mechanism embedded in the New Quality Productive Forces provide a strong impetus for the cross-border integration education strategy. As described by Zhang Pei and Nan Xuguang (2024), the accompaniment and coupling of high-quality vocational education and the New Quality Productive Forces provide a theoretical basis for cross-border integration (Zhang & Nan, 2024).

The application of cloud computing, big data, artificial intelligence and other technologies has made the integration, analysis and application of the resources of the "three religions" more efficient and accurate. Cross-border cooperation breaks down industry barriers and allows education to be closely connected with social, economic and cultural fields. Pan Haisheng and Yang Ying's (2024) study emphasized the role and responsibility of vocational education in the new quality of productivity, which is also applicable to the cross-border integration education strategy (Pan & Yang, 2024). By introducing knowledge and skills from different fields, the cross-border integration education strategy realizes the intersection and integration of knowledge and enhances the comprehensive quality and innovation of students.

The implementation of the cross-border integrated education strategy will promote the sharing of resources and the complementarity of advantages among the three religions. "The three religions will draw on and complement each other to form a more comprehensive education system. This not only enhances the learning effectiveness and competitiveness of students, but also promotes equity in education, so that more people can enjoy quality resources. At the same time, the strategy is also of great significance to social progress and development. It cultivates talents with innovative spirit and cross-border cooperation ability, which will promote industrial upgrading and innovative development and inject new vitality into the social economy. However, the implementation of the cross-border integration education strategy also faces challenges, such as ensuring the quality of integration, avoiding the waste of resources, and protecting the rights and interests of students. Therefore, policy guidance and support are needed to establish a sound regulatory mechanism and evaluation system to ensure the healthy and orderly development of cross-border integrated education. Zhou Shaodong and Li Jing's (2024) study provides policy suggestions for building an innovation-centered education system, which is of guiding significance for the implementation of cross-border integrated education strategies (Zhou & Li, 2024).

5.3 Ecosystem of Industry-Education Integration: A New Paradigm of Collaborative Education Led by New-Quality Productivity

In the new era of intertwining and fusion between education and industry, the integration of industry and education has become a key driving force in promoting talent training and industrial upgrading. Advanced models, such as the Community of Industry-Education Integration and the Municipal Industry-Education Consortium, have constructed a bridge of collaborative education between the "three educations". However, with the rapid development of new productivity, how to further upgrade and optimize the integration model has become an important issue.

The rise of new productivity, especially information technology and artificial intelligence, has injected a strong impetus into the innovation of education mode. In this regard, this paper proposes the "Intelligent Network + integration of industry and education" model, which integrates the dual advantages of "Internet + integration of industry and education" and "AI + integration of industry and education", and opens up a new path for collaborative education.

Under the model of "Intelligent Networking + Integration of Education and Industry", the in-depth application of Internet technology will completely break down the time and space barriers of traditional education, enabling various types of educational resources to be shared and optimized in a wider range. Through the advanced online education platform, the "three education" can be seamlessly connected to provide students with diversified and

personalized learning options and paths. At the same time, Internet technology also greatly promotes in-depth cooperation between schools and enterprises, and the two sides are able to work together to formulate accurate talent training programs based on big data and artificial intelligence technology, realizing the deep integration of education and industry.

In addition, the "Intelligent Networking + Industry-Teaching Integration" model also realizes in-depth insight and analysis of students' learning behaviors and interests and preferences through artificial intelligence technology, so as to provide students with more personalized and precise learning support. This not only significantly improves the learning effect and satisfaction of students, but also effectively promotes the cultivation of innovative and practical talents. For enterprises, this model also provides them with more efficient tools for talent screening and skills assessment, and promotes in-depth cooperation between enterprises and educational institutions.

5.4 Open Resource Symbiosis Network: Integration and Optimization Strategy of Educational Resources Under the New Quality Productive Forces

With the development of New Quality Productive Forces, the integration and optimization of educational resources have become the key to promote the modernization and high-quality development of education. As a cutting-edge educational resource integration model, open resource symbiosis network will provide a new way of thinking for educational resource management with its open and sharing characteristics. It can not only realize the optimal allocation and efficient use of resources, but also has a significant role in promoting the synergistic innovation of "three education".

The construction of an open resource symbiosis network will embody the double victory of technological innovation and policy guidance. The integrated use of cloud computing, big data, artificial intelligence and other cutting-edge technologies will provide strong support for the digital, networked and intelligent management of educational resources. And the precise policy of the government and the active participation of multiple subjects will jointly build an open, cooperative and win-win ecology of educational resources. When discussing the connotation, characteristics and path of New Quality Productive Forces, Hu Ying (2023) emphasized the value goal of satisfying people's aspirations for a better life, and the open resource symbiosis network is an important carrier for realizing this goal (Hu, 2023).

The establishment of an open resource symbiosis network will break down resource barriers and achieve the optimal allocation and efficient utilization of educational resources. The open sharing and interconnection of resources will also eliminate the phenomenon of isolated islands of educational resources, improve the efficiency of utilization, and enable more high-quality resources to benefit more people. At the same time, this sharing model will promote exchanges and cooperation among different educational entities, promote educational innovation and improve the overall quality of education. In terms of collaborative innovation among the three educational institutions, the open resource symbiosis network will also provide opportunities for cross-border cooperation among the three educational institutions, realizing in-depth integration and synergistic development through knowledge circulation and technological innovation, and injecting new vitality into educational innovation.

In addition, the Open Resource Symbiosis Network is concerned with the equitable distribution of resources and the stimulation of potential. Through the establishment of a fair resource distribution mechanism, it ensures that different regions, schools and students can enjoy quality resources. At the same time, incentive mechanisms and policy guidance motivate all parties to participate in the construction of resources, tapping and releasing the potential of educational resources. For example, measures such as the establishment of an education resources innovation fund and the setting up of an evaluation system all provide strong support for the development and promotion of quality resources.

5.5 Innovation in Education Evaluation System: Reconstruction of Education Quality Standards Driven by New Quality Productive Forces

In the context of the New Quality Productive Forces, the traditional education evaluation system, which focuses excessively on knowledge memorization and test-taking skills, has gradually failed to meet the demand for the overall quality of talents in the new era. The new quality of productivity emphasizes the importance of innovation, efficiency and sustainable development, which will promote a fundamental reform of the education evaluation system.

In response to this change, new standards of educational quality must be reconstructed to meet the needs of the new era. The new standards should focus on the development of diversified abilities such as innovation, critical

thinking and teamwork. Through the use of advanced technologies such as big data and artificial intelligence, it is possible to realize the intelligence and precision of evaluation methods to ensure the scientific and effective evaluation. As Zhang Wei (2024) said, promoting the construction of a learning society in the digital era requires collaborative innovation among vocational education, higher education, and continuing education, which provides a solid theoretical foundation for the innovation of the educational evaluation system (Zhang, 2024).

In the context of the new era, it is particularly important to construct educational evaluation standards that are compatible with the new era. In order to break the traditional boundaries and realize the sharing of educational resources, the comprehensive development of students' comprehensive quality and key abilities should be pursued. The new evaluation standard should not only utilize advanced technology to achieve intelligent and precise evaluation, but also focus on the feedback and application of evaluation results to promote the continuous improvement of education. At the same time, the diversification of evaluation subjects, covering students, teachers, parents and all sectors of society, can enhance the objectivity and fairness of evaluation and stimulate students' motivation and creativity.

With the advent of the new era, the demand for talent cultivation is undergoing a profound change. In order to adapt to this change, it is crucial for the modernization and high-quality development of education to build an education evaluation system that matches the talent training needs of the new era. This system should focus on the cultivation of students' comprehensive quality and key abilities, such as innovation, critical thinking, teamwork, etc., to ensure that students have the ability to meet future challenges. At the same time, the assessment system should respect students' individual development and innovative spirit, and encourage each student to realize his/her unique potential and strengths. In addition, the evaluation system should be closely aligned with the needs of society, pay attention to the dynamics and trends of social development, and adjust the evaluation content and standards in a timely manner, so as to ensure that the talents cultivated can adapt to and lead the trend of social development.

6. Summary

Driven by new productivity, "tri-education" collaborative innovation is becoming a key force for change in the field of education. Through the in-depth integration of vocational education, higher education and continuing education, this model breaks down the traditional barriers to education, realizes the optimal allocation and sharing of educational resources, and vigorously promotes the overall improvement of educational quality. The rise of new productivity has provided unprecedented opportunities for "three-education" collaborative innovation, and the close combination of technological innovation and educational innovation has enabled the field of education to gradually realize the development of intelligence and digitization, and provided strong support for the cultivation of cross-border innovative talents. However, challenges have also arisen, such as the imbalance of educational resources, the complexity of policy coordination, and the construction of the teaching force, which need to be resolved. Looking to the future, we should take the lead of new productivity, continuously optimize the "three-education" collaborative innovation strategy, promote the in-depth integration of education and social development, cultivate more high-quality talents, and jointly build a better educational future.

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