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Construction of high quality agricultural vocational education system from the perspective of system theory

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Abstract: *In the new era, constructing a high-quality agricultural vocational education system is of paramount significance for attaining socialist modernization. Based on system theory, this paper conducts an in-depth exploration. It first elaborates on the theoretical basis by precisely defining "system" and "system theory" and their correlations with vocational education, laying a solid foundation. Then, it expounds on the value pursuits. Evidently, this system is an indispensable part of educational modernization, meeting the requisites of high-quality development and guaranteeing rural revitalization. Finally, a suite of development strategies is put forward. These include implementing the system development strategy to integrate agricultural vocational education, the equity promotion strategy for equal opportunities, the structure optimization strategy to fit agricultural and rural needs, the quality enhancement strategy for talent development, the reform and innovation strategy for comprehensive progress, and the function transformation strategy for educational governance. Through the joint implementation of these strategies by all parties, the cultivation of high-quality agricultural talents and the advancement of agriculture and rural areas can be realized, offering robust support for socialist modernization.*

Keywords: *System theory; agricultural vocational education; educational modernization; rural revitalization*

1. Introduction

In the new era and new journey, the accomplishment of building a socialist modernization power, the attainment of the second centenary goal, and the comprehensive advancement of the great rejuvenation of the Chinese nation through Chinese-style modernization are highly dependent on education, science and technology, and talents. The report of the 20th National Congress of the CPC (Communist Party of China) highlights the importance of collaborative and continuing education as well as the promotion of industry-education integration, which charts the course for constructing a high-quality education system. Among this, the construction of a high-quality agricultural vocational education system is of utmost significance. To fulfill the task, it is necessary to fully implement strategies such as rejuvenating the country through science and education, strengthening the country through talents, and innovation-driven development, and accelerate the establishment of a high-quality education system. This requires overall planning of vocational education, higher education, and continuing education for collaborative innovation, promoting the integration of vocational education, industry-education integration, and science-education integration, and optimizing the type positioning of vocational education as proposed in the 20th National Congress report. This embodies the perspective of system theory and holds great importance for the construction of a high-quality education system in the new era. Considering the basic status of agricultural vocational education, this paper delves into and presents ideas for constructing a high-quality agricultural vocational education system.

2. Theoretical basis: The basic framework of high-quality agricultural vocational education system from the perspective of education system theory

2.1 Explanation of "system" and "System theory"

The word "system" originated from ancient Greece, where "systema" means a part of a whole. The embryonic system theory in ancient times recognized the existence of the system by examining the relationship between parts and the whole. The founders of Marxism highly affirmed the significance of

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the concept of "system" from a philosophical perspective and the necessity of establishing a systematic world view. Although Marx did not specifically study system theory, his research on human society, the most complex system, formed a set of scientific methodological principles. The general system theory proposed by Bertalanffy in the 1930s, along with cybernetics and information theory born around the same time, constitutes the main content of modern system theory. The emergence of modern system theory and system science has provided a new scientific basis for the theory of universal connection in materialist dialectics [1]. The scientific system theory regards things as systems. Its core category is "system", which is related to "elements" and "environment", and has characteristics such as integrity, structure order, and the trend of internal structure optimization [1]. Its basic characteristics such as integrity, hierarchy, and openness form the basic principles of system theory [2].

2.2 Understanding of "vocational education" and "vocational education system"

Vocational education aims to cultivate skilled talents who meet the needs of occupation or work environments. It is oriented by occupational needs, takes practical applied technology and skills as the main content, teaches vocational skills, knowledge, and attitude necessary for vocational activities, and enables learners to acquire or expand their vocational action ability and corresponding professional qualification [3]. The vocational education system consists of the levels, categories, stages, forms, and distributions of vocational education in a country or region, forming a whole with the structure and function of technical and skilled personnel training [3]. In 2022, the General Office of the CPC Central Committee and the General Office of the State Council issued a document clearly defining the reform direction of the modern vocational education system, which is to serve the development of students and society, deepen the integration of industry and education, and promote the high-quality development of vocational education [4].

2.3 The basic framework of the high quality agricultural vocational education system

In the new era, China's development faces new challenges and opportunities. The report of the Party's 20th National Congress of the CPC highlights the tasks of high-quality development and rural revitalization. Rural revitalization requires the support of a variety of agricultural talents. Therefore, it is urgent to construct a high-quality agricultural vocational education system. Its core is to update the concept of agricultural education and reform the education system. Various agricultural-related schools and training institutions should cooperate, and general education, vocational education, and continuing education should be realized to cultivate all levels and types of agricultural and rural talents suitable for rural revitalization and promote the modernization of agriculture and rural areas [4].

3. Value pursuit: Examining the significance of construction from the functional purpose of vocational education

In April 2022, the revised Vocational Education Law of the People's Republic of China stipulates that the state vigorously develops vocational education to meet the needs of the socialist market economy and social development. It aims to improve quality, enhance adaptability, and establish a sound system conforming to the growth law of technical and skilled personnel. Vocational education, including school education and training, focuses on cultivating highly qualified technical talents with comprehensive vocational qualities like ethics, knowledge, and skills for occupations. This clearly shows its purpose is to train such talents and provide strong support for building a modern socialist country. It emphasizes the importance of vocational education in the development process, highlighting its role in promoting economic and social progress by supplying the necessary human resources [5].

3.1 Constructing high quality vocational education system is the necessary meaning of education modernization

The 20th National Congress of the CPC has clearly defined the goal of the Chinese-style modernization. Education modernization is the foundation of socialist modernization, and the modernization of vocational education is an important part of it [6]. China has already built a large education system, and higher education is gradually becoming popularized, and vocational undergraduate education is emerging [7]. The construction of a high-quality agricultural vocational education system meets the requirements of the modernization of people and the education system in educational modernization, and is an important link in realizing the goal of educational modernization in 2035, laying

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a solid talent and skill foundation for building a socialist modernization power [6]. Vocational undergraduate education has become an important part of the annual increase of undergraduate education, which meets the diversified needs of talent training goals in the development stage of higher education popularization [8].

3.2 The construction of a high-quality vocational education system: an inherent need for high-quality development

The transformation of the principal contradiction in society has promoted China to enter the stage of high-quality development. As the report to the 19th CPC National Congress pointed out, "As socialism with Chinese characteristics has entered a new era, the principal contradiction facing Chinese society has evolved into the contradiction between unbalanced and inadequate development and the people's ever-growing needs for a better life." Education plays a crucial role in this process. The construction of a high-quality agricultural vocational education system is an important path to implement strategies such as rejuvenating the country through science and education. It provides human and technological support for the development of modern agricultural economy. In the past decade, vocational education has provided many talents for various industries and has played a significant role in manufacturing, emerging industries, and service industries, effectively promoting industrial upgrading and economic transformation, and is one of the core driving forces for realizing high-quality development [9].

3.3 The Construction of a high-quality agricultural vocational education system is an important guarantee for comprehensively promoting rural revitalization

The rural revitalization strategy is a key layout of the country. Agricultural vocational education closely connects with the transformation of the agricultural industry, and provides a variety of talents for the countryside through school-village cooperation, the creation of service platforms, and the implementation of training [10]. Many higher vocational colleges and secondary vocational schools have achieved remarkable results in rural revitalization talent training, fully demonstrating the crucial guarantee role of a high-quality agricultural vocational education system in promoting the comprehensive revitalization of rural industries, talents, and other aspects, and facilitating the modernization of agriculture and rural areas [8].

4. Development strategy: Discussing the construction practice of the system from the reform and innovation of vocational education

4.1 Implement the systematic development strategy and promote the integrated development of agricultural vocational education

All levels of educational administrative departments should play a leading role in this process. They need to formulate comprehensive policies and plans that consider the long-term development needs of the agricultural sector and the regional economic characteristics. For example, in regions with a strong agricultural base, they can focus on developing specialized agricultural vocational education programs that target the unique crops or farming techniques of the area. School-running units, including agricultural vocational schools and colleges, should strengthen their internal management and curriculum integration. They can establish interdisciplinary research centers or teaching teams that combine different agricultural disciplines such as agronomy, horticulture, and agricultural engineering. This will enable students to gain a more comprehensive understanding of the agricultural field. Social forces, such as agricultural enterprises and industry associations, should be actively involved in the education process. They can provide internships, practical training opportunities, and even financial support. For instance, an agricultural machinery company can donate modern farming equipment to the school for practical teaching, and offer internships for students to learn about the operation and maintenance of the equipment. Through the joint efforts of all parties, a seamless integration of agricultural vocational education can be achieved, enhancing its effectiveness in serving rural revitalization.

4.2 Implementing the strategy of promoting equity to ensure equal educational opportunities for urban and rural populations

Educational equity serves as a crucial foundation for social equity, with equality of opportunity being the key and guaranteeing citizens' legal right to education as the basic requirement. In the context of

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primary and secondary compulsory education, the government should significantly increase financial investment in rural schools. This entails constructing modern classrooms equipped with state-of-the-art multimedia teaching facilities, enhancing laboratories to meet the specific requirements of agricultural science experiments, and enriching the school library's collection of agricultural literature. Concurrently, it is essential to reinforce the training of rural teachers. Regular professional development programs should be organized to update their teaching methodologies and agricultural knowledge.

Regarding post-high school education, efforts should be made to ensure that rural students, regardless of their college entrance examination results, have fair access to higher education. Specifically, the construction of the agricultural vocational education system needs to be strengthened. For those "citizens" from agricultural backgrounds who did not pass the college entrance examination and the "new farmers" remaining in rural areas, targeted training and education should be provided to enhance their theoretical knowledge and practical skills. Moreover, colleges and universities can establish special admission channels for rural students, such as implementing a rural student quota system to guarantee a certain proportion of rural students are admitted. Additionally, the scholarship and bursary system for rural students should be further enhanced. Scholarships can be awarded based on students' academic achievements and practical accomplishments in agricultural projects, while bursaries can be provided to students from economically disadvantaged families to cover their living expenses and tuition fees. This will enable rural students to focus on their studies and effectively narrow the urban-rural educational gap.

4.3 Implement the strategy of optimizing the structure to promote agricultural vocational education to meet the development needs of agriculture, rural areas and farmers

To construct a comprehensive and effective agricultural vocational education system that caters to the diverse educational needs of people in both rural and urban areas, several key steps need to be taken.

First and foremost, higher agricultural vocational education institutions such as agricultural universities and colleges should take the lead. They should not only integrate general education courses like mathematics, physics, and chemistry with vocational education courses in a more refined and systematic manner, as demonstrated in the teaching of agricultural chemistry where the principles of chemistry are combined with the practical application of fertilizers and pesticides. But also, they need to incorporate adult education resources to offer continuous learning opportunities for farmers and agricultural workers. This integration should be flexible, combining academic and non-academic, long-term and short-term learning. For example, during the off-season of farming, short-term training courses can be organized to introduce new agricultural technologies and management strategies. Additionally, with the support of rural agricultural vocational schools, primary and secondary schools, an all-encompassing agricultural education system integrating general education, vocational education, and adult education should be established. This system should adhere to the principles of combining different forms of education, such as academic with non-academic and long-term theory with short-term skills training.

Secondly, when establishing rural community colleges, it is crucial to draw on the successful experiences of foreign community colleges. By fully leveraging the existing hardware resources like classrooms and facilities in rural education institutions and the software resources such as disciplines and teachers from agricultural colleges, rural community colleges can be effectively set up. The curriculum design of these colleges should focus on practical skills that are highly relevant to rural development, including rural handicrafts, e-commerce, and agricultural product processing. Moreover, cultural and recreational activities related to rural life can be organized to enhance the cultural and spiritual well-being of rural residents, thereby comprehensively improving their quality of life.

Finally, the active integration of resources and advantages among higher agricultural colleges, local governments, and agricultural enterprises is essential. Agricultural colleges and universities should continuously explore and optimize their discipline and professional structures. Through in-depth research on the development trends of the agricultural industry and collaboration with agricultural research institutions, new majors can be developed. For instance, with the rise of smart agriculture, majors related to agricultural informatics and intelligent equipment can be introduced. The government should increase financial support for agricultural education in universities to ensure the availability of necessary resources. At the same time, agricultural enterprises should play an active role in practical teaching by providing experimental and practice bases, as well as employment and entrepreneurship platforms. They can also send experienced technicians to schools for lectures and hands-on guidance, thus promoting the coordinated development of education and industry and realizing the goal of improving the agricultural vocational education system for urban-rural integration and enhancing the overall educational level of

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the population.

4.4 Implementing the strategy of improving quality to promote agricultural vocational education to adapt to the professional development of talents

Improving the quality of education is the core of educational reform. In the teaching process, it is necessary to adhere to people-oriented and promote quality education. The integration of the educational policies and core values of the Communist Party of China into the teaching process should be more in-depth. For example, in the teaching of agricultural ethics, students can be taught about sustainable development concepts and the importance of protecting the ecological environment in agricultural production. Curriculum reform should be further deepened. New courses such as agricultural innovation and entrepreneurship can be added to cultivate students' innovation and entrepreneurship abilities. In physical education, special sports events related to agriculture, such as farming competitions and rural sports games, can be organized to enhance students' physical fitness and teamwork spirit. In aesthetic education, students can be guided to appreciate the beauty of rural landscapes and traditional rural culture.

Regarding the teaching workforce, efforts should be made to enhance its construction. The rights and interests of rural teachers and those engaged in agriculture - related education should be safeguarded. This includes providing them with better housing conditions, professional title promotion opportunities, and salary increases. Teacher exchanges should be promoted to a more institutionalized level. Regular teacher exchange activities can be organized between urban and rural schools or between different agricultural vocational education institutions to share teaching experience and resources. In terms of educational investment, a mechanism that ensures its growth should be established. The government can set aside a special fund for agricultural vocational education every year, and encourage social donations through tax incentives and other policies. Resources should be allocated rationally.

Schools can use the funds to purchase advanced teaching equipment, build experimental fields and training bases, and develop teaching materials. Leverage information technology to construct a teaching platform. Online courses can be developed to provide students with more flexible learning methods. Virtual reality and augmented reality technologies can be used to create immersive teaching environments, such as simulating agricultural production processes and farm management scenarios, ultimately improving the quality of talent cultivation.

4.5 Implementing the strategy of reform and innovation to promote the all-round development of agricultural vocational education to serve the people

Reform and innovation are the driving forces for educational development. In the reform of the exam evaluation and enrollment systems, scientific evaluation indicators should be constructed based on the characteristics of agricultural vocational education. In addition to academic performance, practical skills and innovation abilities should be given more weight. For example, students' performance in agricultural practical projects, such as crop cultivation experiments and livestock breeding practices, can be included in the evaluation. Multiple assessment elements should be integrated. Oral presentations, project reports, and field operation demonstrations can be used as assessment methods. In the reform of the talent training system, modern educational concepts should be firmly established. Student-centered teaching methods should be widely adopted. For example, project-based learning and problem-solving learning can be carried out to stimulate students' learning enthusiasm and creativity. The evaluation system should be innovated. In addition to traditional teacher evaluations, peer evaluations and self-evaluations can be added to make the evaluation more comprehensive and objective. In the reform of the school-running system, the collaborative mechanism of multiple subjects should be improved. Public and private schools can cooperate in curriculum development, teacher training, and resource sharing. For example, private schools can introduce advanced teaching management experience from public schools, and public schools can learn from the flexible operation mechanisms of private schools. A pattern of common development of public and private education should be formed. In the school system reform, schools should be encouraged to serve society. They can set up agricultural technology extension centers to provide technical services for farmers. The internal management and supervision mechanism should be improved. A democratic management system can be established to allow teachers, students, and parents to participate in school management. The legal management of education should be realized to ensure the normal operation of schools, promoting the all-round development of agricultural vocational education.

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4.6 Implementing the strategy of function transformation to promote education governance to adapt to modern development

The government should streamline administration and delegate power in educational governance. It can reduce unnecessary administrative approvals and simplify the management process. For example, in the approval of new agricultural vocational education programs, a more streamlined and efficient process can be adopted. The shift from micro-management to macro-governance should be accelerated. The government should focus on formulating overall development strategies and policies, rather than interfering in the specific teaching and management details of schools.

The reform of the education supervision system should be deepened. A comprehensive supervision mechanism that combines internal and external supervision should be established. Internal supervision can be carried out by schools themselves through self-evaluation and internal audit. External supervision can be carried out by educational administrative departments, social organizations, and the public. A dynamic evaluation system should be constructed. The evaluation indicators should be updated in a timely manner according to the development of the times and the needs of the industry. A professional supervision team should be formed. The team members should have professional knowledge in agriculture and education to ensure the effectiveness of supervision. To ensure the efficient operation of the agricultural vocational education system, scientific and democratic decision-making should be promoted. Stakeholders' participation mechanisms should be explored. For example, regular seminars and hearings can be held to listen to the opinions and suggestions of students, teachers, educational administrators, and industry partners.

Pilot reforms should be initiated. In some regions or schools, new educational models and management methods can be tested first. For example, a new curriculum system or teaching method can be piloted in a certain agricultural vocational school. Through the pilot, problems can be found and solutions can be explored. Finally, the efficiency of educational governance should be enhanced. The management process should be optimized by using information technology. For example, an educational management information system can be established to improve the efficiency of resource allocation and communication channels, better supporting the smooth and effective functioning.

5. Conclusion

The construction of a high-quality agricultural vocational education system represents a highly complex and comprehensive systematic project. Firmly founded on system theory, it calls for the seamless integration of theoretical knowledge, value pursuits, and strategic initiatives. This integration is far from achievable by a single entity; rather, it demands the joint and persistent efforts of all parties concerned. Educational administrative departments at different levels must take the lead in devising far-sighted policies and offering effective guidance. School-running institutions should concentrate on optimizing internal management structures and enhancing curriculum integration. Social forces, like enterprises and industry associations, need to actively participate by providing practical support and valuable resources.

By steadfastly deepening reforms in multiple dimensions such as teaching approaches, evaluation systems, and school-running models, we can effectively break through existing constraints. Optimizing resources implies the rational allocation of educational funds, teaching facilities, and human resources to guarantee their efficient utilization. Enhancing quality requires continuous attention to improving teaching content, strengthening the teaching workforce, and capitalizing on advanced educational technologies. Innovating governance involves streamlining administrative procedures, augmenting the effectiveness of supervision, and promoting democratic and scientific decision-making. Through these collective endeavors, a substantial number of high-quality agricultural talents with both solid professional knowledge and strong practical and innovative abilities can be successfully nurtured. These talents will provide a firm talent guarantee for rural revitalization and socialist modernization, continuously fuel the development of agricultural vocational education, and play a vital role in attaining the goal of constructing an educational power.

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References

[1] Xiao Qian (Ed.). Principles of Marxist Philosophy (Volume 1), 2nd edition. Beijing: China Renmin University Press, October 1998, pp. 143-146.
[2] Wei Hongsen. Systems Theory: Philosophy of Systems Science. Beijing: World Book Publishing Company, September 2009, pp. 205-292.
[3] Huang Yao (Ed.). Vocational Education: Principles and applications. Beijing: Higher Education Press, June 2009, pp. 51,132.
[4] The General Office of the CPC Central Committee and The State Council issued the Opinions on Deepening the Reform of the Construction of the Modern Vocational Education System_Relevant Documents of the Central Government [EB/OL]. https://www.gov.cn/zhengce/2022-12/21/content_5732986.htm, 2022-12-21.
[5] Vocational Education Law of the People's Republic of China [EB/OL]. https://www.gov.cn/xinwen/2022-04/21/content_5686375.htm, 2022-04-21.
[6] Liu Fuxing (Ed.). Adhere to the service of the great rejuvenation of the Chinese nation as an important mission of education. Beijing: China Renmin University Press, October 2021, p. 13,23.
[7] Liu Fuxing et al. High-quality education system and all-round development of people. Beijing: China Renmin University Press, September 2022, p. 14.
[8] China National Institute of Education Sciences, National Joint Conference of Presidents of Vocational Colleges and Universities.2022 China Vocational Education Quality Annual Report. Beijing: Higher Education Press, March 2023, p. 6, 15, 77.
[9] Edited by Ministry of Education of the People's Republic of China. China Vocational Education Development Report 201-2022. Beijing: Higher Education Press, February 2023, pp. 13-14.
[10] Opinions of the CPC Central Committee and The State Council on Comprehensively Promoting Rural Revitalization and Accelerating the Modernization of Agriculture and Rural Areas _ Relevant Documents of the Central Committee [EB/OL]. https://www.gov.cn/zhengce/2021-02/21/content_5588098.htm, 2021-02-21.