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Research on the Internal Logic and Practical Path of Digital Empowerment for Rural Talent Revitalization

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Abstract

Digital technology provides a historic opportunity to address the challenges of revitalizing rural talent. However, current practices still face multiple practical dilemmas related to foundational aspects, subjectivity, collaboration, and sustainability. These dilemmas are interconnected and often reinforce one another, creating a complex barrier to progress. This article systematically expounds on the inherent logic of digital empowerment for rural talent revitalization, proposing the construction of a multi-level and integrated practical path. By strengthening the digital foundation, establishing a digital talent training system, promoting the integration of digital industries and talents, and improving policy support and security systems, this approach systematically resolves dilemmas and provides theoretical reference and practical guidance for comprehensively promoting rural revitalization.

Keywords

Digital Empowerment, Rural Revitalization, Rural Talents, Path Exploration

1. Introduction

As a key national strategy to address imbalanced urban-rural development and accelerate the modernization of agriculture and rural areas, the Rural Revitalization Strategy has been comprehensively implemented in China. This strategy encompasses multiple dimensions, including industrial development, talent cultivation, cultural prosperity, ecological sustainability, and organizational strengthening. Among these, talent revitalization serves as a fundamental and crucial project, providing the essential human capital and intellectual support for implementing the rural revitalization strategy. However, for a long time, rural areas have faced

severe challenges such as talent outflow, structural imbalance, and low overall quality, which have restricted the process of agricultural and rural modernization. The advent of the digital era provides a historic opportunity to address this dilemma. Digital technologies represented by big data, artificial intelligence, and the Internet of Things, with their characteristics of permeability, inclusiveness, and synergy, are profoundly reshaping the entire chain of "attracting, cultivating, retaining, and utilizing" rural talents. However, issues such as uneven coverage of digital infrastructure in rural areas, low overall digital literacy among residents, insufficient supply of composite digital talents, and the absence of policy coordination mechanisms have severely constrained the full release of digital dividends. Based on this, this study attempts to clarify the inherent logic of digital empowerment for rural talent revitalization and proposes a multi-level and operable practical path to address the current dilemmas, aiming to provide theoretical reference and practical guidance for comprehensively promoting rural revitalization (Wang, Yi, & Yang, 2024).

2. The Inherent Logic of Digital Empowerment for Rural Talent Revitalization

The inherent logic of digital empowerment for rural talent revitalization is rooted in the systematic reshaping of traditional rural talent development paradigms by digital technology, which is specifically manifested in three core mechanisms.

2.1. Information Equality Mechanism

Digital technology, through its inherent attributes of connectivity and sharing, effectively breaks down the information barriers between urban and rural areas. The popularization of high-speed Internet and smart terminals enables rural talents to access knowledge, technology, market information, and policy information without discrimination, achieving unprecedented "knowledge accessibility". The widespread application of online education platforms and remote collaboration tools enables high-quality educational resources and high-end employment opportunities to be directly delivered to rural areas, bypassing geographical barriers. This provides talents with low-cost, high-efficiency channels for lifelong learning and decent work, fundamentally weakening the constraints of geographical factors on personal development.

2.2. Skill Multiplication Mechanism

Digital technology not only provides access to information but also empowers individuals through innovative training models, accelerating the appreciation of human capital. Leveraging digital tools such as virtual simulation, live streaming teaching, and mobile learning, traditional agricultural technology promotion and vocational training have overcome spatial and temporal constraints, achieving scalability and personalization. This not only rapidly enhances the professional skills of rural talents in areas like agricultural production, e-commerce operations, and digital marketing, but also crucially cultivates the digital literacy and innovative

thinking necessary to adapt to the digital era, thereby facilitating the transformation from "traditional laborers" to "digital new farmers".

2.3. Ecological Reconstruction Mechanism

Digital technology has reshaped the ecosystem for rural talent development by fostering new business models and optimizing governance. The emergence of new business models such as rural e-commerce, smart agriculture, and digital cultural tourism has created new professions like agricultural data analysts, rural e-commerce anchors, and smart agricultural machinery operators, broadening the career development space for talents and enhancing the "pull" of rural areas for diversified and high-quality talents (Lin & Ye, 2025). At the same time, digital governance platforms have facilitated collaboration between the government, enterprises, universities, and rural communities, promoting precise implementation of talent policies and optimized provision of public services, creating a benign development environment for talents that is "attractive, retainable, and effective".

3. The Practical Dilemmas of Digital Empowerment for Rural Talent Revitalization

Despite the vast prospects that digital technology has opened up for the revitalization of rural talent, it still faces multiple practical dilemmas in the actual process of empowerment. These dilemmas are intertwined, forming a structural barrier that restricts the full exertion of its effectiveness.

3.1. Fundamental Dilemmas

The dual imbalance between digital infrastructure and access capability represents the "hardware" bottleneck of digital empowerment. On the one hand, despite the continuous improvement in network coverage, high-speed and stable network access capabilities remain weak in many rural areas, especially remote mountainous regions. The "last mile" problem has not been fully resolved, which restricts the implementation of advanced applications such as big data and cloud computing. On the other hand, the more profound issue is the "digital divide". It has evolved from a mere "access divide" to a "skills divide" and a "usage divide". The elderly and low-education groups in rural areas face significant difficulties in operating smart devices, identifying information, and protecting network security, which leads to their exclusion from the digital dividend and hinders their effective participation in the process of digital empowerment.

3.2. Subjectivity Dilemma

The inadequate digital literacy of rural talents and the structural shortage of compound talents are the "software" shortcomings of digital empowerment. The overall digital literacy of rural residents is relatively low, and there is a widespread phenomenon of "not daring to use, not knowing how to use, and not being able to afford". This makes it difficult for digital tools to integrate into daily production

and life, greatly reducing their application efficiency. More importantly, rural areas are extremely short of compound talents who are both familiar with local industries and proficient in digital technology. The existing education system and training content are often disconnected from the actual needs of rural areas, resulting in trained talents unable to meet the job requirements of emerging fields such as smart agriculture, rural e-commerce data analysis, and rural digital governance, forming a structural contradiction of "talents cannot find jobs, and jobs cannot find talents".

3.3. Coordination Dilemma

The lack of coordination among multiple stakeholders and the absence of systematic support constitute obstacles in the "system" of digital empowerment. Effective digital empowerment requires a joint effort from the government, market, society, and rural communities. However, the phenomenon of "data silos" is prevalent, with data barriers standing between various departments, hindering the sharing of talent information and business collaboration (Meenu et al., 2025). In addition, many empowerment policies exhibit a "top-down" supply characteristic, which does not match the real needs and characteristics of rural areas, resulting in policy suspension and resource mismatch. The potential of market mechanisms and social forces has not been fully tapped, and sustainable business models and a collaborative ecosystem have not been formed, making digital empowerment projects often difficult to sustain after external support weakens (Li et al., 2025).

3.4. Sustainability Dilemma

The weakness of the industrial ecosystem and the absence of a long-term incentive mechanism are core challenges that determine the sustainability of empowerment effectiveness. The digital industrial ecosystem in many rural areas is still in its infancy, with short industrial chains and small market scales, making it difficult to provide competitive salaries and clear career development paths, leading to "difficulty in attracting and retaining talent" (Zhong, 2025). At the same time, targeted and long-term incentive and security mechanisms for rural digital talents are generally absent. In the absence of effective material rewards, social recognition, and professional growth opportunities, the intrinsic motivation for talents to engage in rural digital construction is difficult to be continuously stimulated, and the risk of talent loss remains high.

It is crucial to recognize that these four dilemmas are not isolated but are deeply interconnected and mutually reinforcing. The Fundamental Dilemmas create the initial barrier: without robust infrastructure and universal access capabilities, efforts to improve digital literacy are inherently constrained. Conversely, low digital literacy reduces the effective demand and utilization of existing infrastructure, weakening the economic case for further investment. The Coordination Dilemma exacerbates both fragmented governance and a top-down approach, leading to misaligned training programs that fail to address the actual skill gaps or the needs

of a nascent industrial ecosystem. Ultimately, the Sustainability Dilemma is the culmination of the first three: a weak talent pool and uncoordinated support systems prevent the growth of a vibrant digital economy, which in turn fails to create the attractive opportunities needed to break the cycle of talent outflow and sustain empowerment efforts. Viewing these dilemmas as a synergistic system is essential for developing holistic solutions.

4. The Practical Path of Digital Empowerment for Rural Talent Revitalization

To address the interconnected dilemmas outlined above, this paper proposes a systematic "Four-in-One" practical path. This framework integrates four critical and synergistic components: strengthening the digital foundation, optimizing the talent cultivation system, promoting the integration of digital industries and talents, and improving policy support and security systems.

4.1. Strengthen the Digital Foundation and Bridge the Digital Divide

We should continue to increase investment to promote the extension of new infrastructure, such as 5G and gigabit optical networks, to remote rural areas, and focus on solving the problem of network coverage in remote areas (Wang, Xu, & Zhang, 2024). At the same time, we should promote the supply of inclusive digital services, develop age-friendly and easy-to-operate terminals and applications, lower the threshold for use, and ensure the sharing of digital dividends. In some Chinese counties, local governments have partnered with telecom operators to deploy public Wi-Fi in village centers and provide subsidized, simplified smartphones for the elderly. This not only improves access but also directly addresses the "skills divide" by reducing the complexity of technology use.

4.2. Optimize the Talent Cultivation System and Activate Endogenous Motivation

Firstly, we should integrate online and offline educational resources, build a digital education platform at the county level, gather high-quality courses, and promote the integrated model of "online theoretical teaching + offline practical guidance" (Wang, 2025). Secondly, targeted digital skills training should be carried out, based on local industry needs and talent types, with precise training ranging from basic literacy to professional skills (such as e-commerce and data analysis), conducted in a hierarchical and classified manner. Thirdly, a digital talent evaluation mechanism should be established, using big data to dynamically track and evaluate talent abilities and contributions, achieving precise incentives oriented towards abilities. A successful initiative in Zhejiang Province involved conducting surveys and focus groups with local farmers and young returnees to identify their specific learning needs. Based on this feedback, "Digital Literacy Bootcamps" were co-designed with the community, focusing on practical skills like live-streaming for local specialty products. This bottom-up approach ensures training is relevant

and empowers rural residents by valuing their agency and self-identified needs.

4.3. Promote the Integrated Development of Digital Industries and Talents, and Create a Cluster Ecosystem

Actively cultivate new forms of rural digital industries, such as smart agriculture, rural e-commerce, and digital cultural tourism, to attract talents driven by industry needs (Chao, 2025). At the same time, strengthen the connection between industries and talents (Yang & Zhu, 2024), build a digital platform for talent supply and demand, achieve intelligent matching between talents and projects, and markets, and form a virtuous cycle of "industry attracts talents, talents promote industry".The "Taobao Village" model in China serves as a powerful case study. The emergence of e-commerce clusters for specific products (e.g., furniture in Shaji, Jiangsu) created a critical mass of job opportunities, attracting digital-savvy young people back to their hometowns. This market-driven ecosystem naturally fostered peer-to-peer learning and sustainable talent aggregation.

4.4. Improve Policy Support and Guarantee System, Optimize Institutional Environment

The government needs to strengthen top-level design and formulate incentive policies that encompass financial subsidies, tax incentives, and entrepreneurial support. More importantly, it is necessary to break down departmental barriers and establish a diversified and collaborative governance mechanism involving "government-business-university-society", ensuring precise and targeted allocation of policy resources and providing sustainable institutional support for digital empowerment. While designing supportive policies, it is crucial to consider potential negative externalities. For instance, policies promoting rural gig economy platforms (e.g., for agricultural service provision) should be coupled with regulations that ensure data privacy for farmers and address the precarity of gig work by establishing basic labor protections and social security linkages. This ensures that digital empowerment does not come at the cost of increased vulnerability.

5. Conclusion

The comprehensive revitalization of rural areas is a systematic project that requires the collaborative participation of diverse forces. We must adopt a co-construction mindset to establish a co-construction mechanism featuring "policy guidance, market leadership, and social participation". By harnessing digital power to break down urban-rural barriers and connect diverse entities, we can form a pattern of "everyone participating and everyone sharing" for co-construction and common prosperity, thereby injecting more new momentum into the comprehensive revitalization of rural areas. It is important to acknowledge that the digital empowerment process is not without risks, including the potential for widening inequality between the digitally literate and non-literate, data privacy concerns, and the instability of some digital platform work. Currently, practical achievements and difficulties coexist. In the future, to promote digital empower-

ment, we must adhere to systematic thinking and construct and collaboratively advance a four-in-one practical path of "infrastructure—digital literacy—industrial ecology—policy guarantee", while remaining vigilant and proactive in mitigating associated risks.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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