Development Economics of China
2025, VOL. 9, NO. 8, 146-151
DOI: 10.47297/wspdecWSP2515-797327.20250908

Synergy Mechanism between Enterprise's Long-Term Strategy and Vocational Education Talent Cultivation: Taking Pinduoduo's Agricultural Digitalization as an Example

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ABSTRACT

Against the backdrop of agricultural digital transformation becoming a national strategy, Pinduoduo has regarded agricultural digitalization as its long-term core strategy. It has promoted industrial upgrading through initiatives such as the "Ten-Billion-Yuan Agricultural Research Program", "big data for agricultural assistance", and "rural e-commerce ecosystem construction". However, the shortage of interdisciplinary talents who are "proficient in both agriculture and digital technology" has become a key bottleneck for the implementation of this strategy. Taking Pinduoduo's agricultural digitalization strategy as the research object, this paper combines the practical needs of vocational education talent cultivation and adopts the case study method to analyze the synergy foundation, synergy mechanism, and application effects between the enterprise's long-term strategy and vocational education talent cultivation. The study finds that the two parties can achieve in-depth integration through a four-dimensional mechanism of "Goal Synergy - Content Synergy - Resource Synergy - Evaluation Synergy": Pinduoduo clarifies the talent cultivation objectives based on industrial demands; vocational colleges restructure courses to align with the enterprise's practical operation scenarios; the two parties share resources through "joint construction of practical training bases + joint cultivation by dual tutors"; and finally, a closed loop of talent evaluation is completed based on the enterprise's post competency standards. This synergy mechanism not only alleviates the talent gap in Pinduoduo's agricultural digitalization but also promotes the employment rate of relevant majors in vocational colleges to rise to 92.3%, realizing the mutual empowerment of enterprise strategy implementation and high-quality development of vocational education.

KEYWORDS

Pinduoduo; Agricultural digitalization; Vocational education; Talent cultivation; Synergy mechanism

1 Introduction

Agricultural digitalization is key to addressing issues concerning agriculture, rural areas, and farmers, and to advancing rural revitalization. The *14th Five-Year Plan for Agricultural and Rural Modernization* explicitly mandates accelerating the digital transformation of the entire agricultural industrial chain and fostering new forms of agricultural digital economy. As a leading player in agricultural digitalization among domestic e-commerce platforms, Pinduoduo has integrated "revitalizing agriculture through technology" into its long-term strategy since 2015, building an agricultural digital ecosystem via three core initiatives: establishing a big data platform for agricultural product supply-demand matching, launching the "Ten-Billion-Yuan Agricultural Research Program" to develop production-side digital tools, and providing rural e-commerce training through "Duoduo University". By 2021, Pinduoduo's agricultural product GMV reached 2.441 trillion yuan with over 11.5 million active agricultural merchants, yet industry expansion revealed a severe talent shortage—per platform research, gaps exceeded 890,000 for roles like rural e-commerce operators and agricultural data analysts, and 62% of merchants faced delayed digital transformation due to insufficient professionals.

Vocational education, as "industry's closest educational counterpart", is tasked with supplying skilled, interdisciplinary talents. However, its synergy with agricultural digitalization remains disconnected: agriculture-related majors still prioritize traditional planting/breeding curricula (digital courses like agricultural big data account for <20%), while enterprises only engage in short-term cooperation without deep involvement in curriculum design or assessment. Exploring a "synergy mechanism between enterprises' long-term strategies and vocational education talent cultivation" is thus practically significant—it can resolve talent bottlenecks for firms like Pinduoduo and offer a replicable model for vocational education's "industry-education integration" reform.

Focusing on Pinduoduo's agricultural digitalization strategy, this paper addresses three research questions: What is the foundation for this synergy? How to build a synergetic closed loop from "industrial demand" to "talent output"? What are the mechanism's application effects? The analysis aims to provide theoretical references and practical paths for in-depth collaboration between agricultural digitalization enterprises and vocational colleges.

2 Literature review

2.1 Research on agricultural digitalization and talent demand

Foreign scholars paid attention to the talent support for agricultural digitalization relatively early. Liu et al. (2025) noted that a report on the U.S. agricultural Internet of Things (IoT) industry pointed out: "Digital agriculture requires three-dimensional talents with 'agricultural knowledge + digital skills + operational thinking', and the traditional agricultural education system cannot meet this demand". Domestic studies mostly focus on talent gaps and competency dimensions: Through research, Ke et al. (2025) found that China's agricultural digitalization talents need to possess three core competencies, namely "data collection and analysis, e-commerce platform operation, and digital tool application", among which the gap in rural e-commerce operation talents is the largest (accounting for 45%); Ma (2025) further pointed out that the current cultivation of agricultural digitalization talents has two pain points—"disconnection between college courses and industrial demands, and low enterprise participation"—and it is necessary to establish an "industry demand-oriented" cultivation model.

2.2 Research on the synergy model between vocational education and enterprises

A variety of theoretical frameworks have been formed for the synergy model between vocational education and enterprises, among which the "three-dimensional model of school-enterprise cooperation" is the most representative. The first is the "resource-complementary type", where enterprises provide practical training equipment and positions, and colleges provide teaching staff and teaching venues (Rao et al., 2023); the second is the "goal-aligned type", where enterprises clarify talent standards based on strategic needs, and colleges design training programs in accordance with these standards (Huang, 2022); the third is the "evaluation-integrated type", which incorporates enterprise post assessment standards into the college talent evaluation system. However, existing studies mostly focus on the manufacturing and service industries, with few studies on the synergy model in the field of agricultural digitalization, and they lack micro-mechanism analysis on "how to deeply bind enterprises' long-term strategies with talent cultivation".

2.3 Literature commentary

Existing studies have recognized the talent gap in agricultural digitalization and the importance of synergy with vocational education, but there are two shortcomings: First, they fail to design a synergy mechanism based on the dynamic needs of enterprises' long-term strategies, and most of them are "static talent competency analysis"; second, they lack in-depth analysis of specific enterprise cases, making it difficult to form implementable operational paths. Taking Pinduoduo's agricultural digitalization strategy as a case, this paper constructs a "goal-content-resource-evaluation" four-dimensional mechanism from the perspective of "dynamic synergy", to make up for the deficiencies of existing studies.

3 Analysis of pinduoduo's agricultural digitalization strategy and talent demand

3.1 Core initiatives of pinduoduo's agricultural digitalization strategy

Pinduoduo's agricultural digitalization strategy is centered on the "digitalization of the entire industrial chain", forming full coverage of the "production side - circulation side - consumption side". The specific initiatives are as follows:

3.2 Production side: empowering farmers with digital tools

Through the "Ten-Billion-Yuan Agricultural Research Program", Pinduoduo has developed and promoted digital tools for agriculture, such as the "AI Pest and Disease Identification System" (farmers can upload photos of crops to obtain prevention and control plans) and the "Intelligent Planting Monitor" (which collects real-time data on soil moisture and temperature and pushes management suggestions). By 2021, such tools had covered over 300 agricultural production areas across 12 provinces in China, helping farmers reduce production costs by 15%-20%.

3.3 Circulation side: optimizing the supply chain with big data

Pinduoduo has built an "Agricultural Product Big Data Center" that integrates national data on agricultural product production, inventory, and sales, providing farmers with full-process services including "order forecasting - logistics matching - pricing suggestions". For example, apple growers in Shandong Province can obtain "national apple demand distribution for the next three months" through the center and sign orders with merchants on Pinduoduo in advance to

avoid the risk of unsalable goods. In 2021, this center helped increase the circulation efficiency of agricultural products by 28% and reduce logistics costs by 12%.

3.4 Consumption side: building a rural e-commerce ecosystem

Through the "New Brand Initiative", Pinduoduo supports small and medium-sized agricultural merchants in conducting digital operations, providing services such as "store decoration - traffic support - live-streaming training". At the same time, relying on "Duoduo University", it carries out offline training and invites platform operation experts to explain to farmers topics like "Pinduoduo store operation skills" and "methods for live-streaming agricultural product sales". In 2021, the number of rural e-commerce merchants on Pinduoduo exceeded 11.5 million, among which 60% achieved doubled monthly sales through training at "Duoduo University".

4 Synergy foundation between pinduoduo's agricultural digitalization strategy and vocational education talent cultivation

4.1 Policy foundation: industry-education integration policies provide institutional guarantee

In recent years, the state has intensively issued policies to promote the synergy between vocational education and industry. The *National Vocational Education Reform Implementation Plan* clearly states that "an identification system for industry-education integration enterprises shall be established, and enterprises shall be encouraged to participate in vocational education talent cultivation"; the *Opinions on Accelerating the Modernization of Agriculture and Rural Areas* further emphasizes "supporting vocational colleges to set up majors related to agricultural digitalization and cultivate interdisciplinary talents". Policy-level guidance provides an institutional basis for the synergy between Pinduoduo and vocational colleges — for example, Pinduoduo, as an "agricultural digitalization industry-education integration enterprise", can obtain support such as tax reductions and fiscal subsidies, reducing the cost of participating in talent cultivation; vocational colleges, through cooperation with Pinduoduo, can apply for "industry-education integration demonstration majors" to improve the quality of professional construction.

4.2 Resource foundation: significant resource complementarity between the two parties

Pinduoduo and vocational colleges form a "industrial resources - educational resources" complementarity in terms of talent cultivation resources:

Pinduoduo's advantages in industrial resources: It has real agricultural digitalization scenarios (e.g., Big Data Center, rural e-commerce stores), frontline practical experts (e.g., platform operation directors, agricultural research technicians), and job demand data (e.g., talent competency standards, salary levels), which can provide three major supports for talent cultivation: "practical scenarios - teaching staff - standards".

Vocational colleges' advantages in educational resources: They have a systematic teaching system (e.g., curriculum design, theoretical teaching capabilities), stable student resources (in 2021, the number of students in national agricultural vocational colleges exceeded 800,000), and teaching venues and equipment (e.g., computer laboratories, agricultural practical training bases), which can provide three major guarantees for talent cultivation: "systematic teaching - student resources - hardware".

4.3 Demand foundation: highly aligned goals of the two parties

From the demand perspective, the goals of Pinduoduo and vocational colleges are naturally aligned:

Pinduoduo's goals: Alleviate the talent gap in agricultural digitalization positions through talent cultivation to ensure the implementation of long-term strategies; at the same time, reserve talents loyal to the enterprise ecosystem (e.g., graduates prioritize serving platform merchants) to enhance industrial competitiveness.

Vocational colleges' goals: Through cooperation with Pinduoduo, realize "major setup aligned with industrial demands, curriculum content matched with post competencies, and talent output connected to the job market", thereby improving the attractiveness of majors and the employment rate of graduates. Statistics show that in 2021, the average employment rate of national agricultural vocational colleges was 81.5%, while the employment rate of majors with in-depth cooperation with enterprises generally exceeded 90%.

5 Construction of the synergy mechanism between enterprise's long-term strategy and vocational

education talent cultivation

Based on the aforementioned synergy foundation, this paper constructs a four-dimensional synergy mechanism of "Goal Synergy - Content Synergy - Resource Synergy - Evaluation Synergy" to achieve in-depth integration between Pinduoduo's agricultural digitalization strategy and vocational education talent cultivation. The specific paths for the first two dimensions are as follows:

5.1 Goal synergy: anchoring talent cultivation goals with industrial demands

Guided by the post demands of its agricultural digitalization strategy, Pinduoduo jointly formulates "hierarchical and categorized" talent cultivation goals with vocational colleges, avoiding the problem of colleges "setting majors blindly and defining objectives vaguely":

(1) Joint Development of Post Competency Standards: Pinduoduo, together with core merchants on its platform, sorts out the "competency lists" for the three types of posts (mentioned earlier) and converts them into a "talent cultivation objective matrix" for vocational colleges.

(2) Differentiated Design of Cultivation Levels: Differentiated goals are designed for vocational colleges at different academic levels: secondary vocational schools focus on cultivating "operational talents"; higher vocational colleges focus on developing "interdisciplinary talents".

5.2 Content synergy: aligning with enterprise practical scenarios through curriculum restructuring

With Pinduoduo's practical scenarios of agricultural digitalization as the core, vocational colleges restructure their curriculum systems to realize "seamless connection between teaching content and industrial scenarios":

(1) Embedding Industrial Scenarios into Curriculum Modules: Pinduoduo's agricultural digitalization business is decomposed into "curriculum modules" and embedded into traditional professional courses. For example, a "Pinduoduo Agricultural Product Big Data Center Application" module is added to the "Agricultural Economic Management" course, and a "Rural E-Commerce Live-Streaming Operation" module is integrated into the "E-Commerce" course. Meanwhile, "Pinduoduo Agricultural Digitalization Special Practical Training Courses" are offered, accounting for more than 30% of the total class hours.

(2) Joint Development of Teaching Materials and Case Libraries: Pinduoduo provides real industrial cases and jointly compiles characteristic teaching materials with colleges, such as *Pinduoduo Rural E-Commerce Operation Practice* and *Tutorial on the Application of Agricultural Digital Tools*, replacing the traditional "theoretical and impractical" teaching materials.

(3) Transformation of Duoduo University Resources: Offline training courses of Pinduoduo's "Duoduo University" are transformed into "online course resources" for colleges. Students can learn through the college platform and obtain the "Duoduo University Junior Certification" issued by Pinduoduo, realizing the connection between "on-campus learning and enterprise certification".

5.3 Resource synergy: sharing resources through "practical training bases + dual tutors"

The two parties share industrial and educational resources by means of "joint construction of practical training bases and joint cultivation by dual tutors", solving the problems of "insufficient practical training scenarios and lack of practical teaching staff" in vocational colleges:

(1) Two-Way Joint Construction of Practical Training Bases:

Enterprise Side: Pinduoduo (establishes relevant facilities) in the platform's core agricultural production areas.

College Side: Vocational colleges provide Pinduoduo with "support for teaching venues and equipment", and set up "Pinduoduo Agricultural Digitalization Practical Training Centers" for the enterprise to conduct employee training. This realizes "two-way utilization of bases and efficient use of resources".

(2) Dual-Tutor Joint Cultivation Mechanism:

Enterprise Tutors: Pinduoduo selects frontline experts to serve as "enterprise tutors", who are responsible for teaching practical training courses and guiding graduation projects, and teach no less than 4 class hours at the college every month.

College Tutors: Vocational colleges assign professional teachers to act as "college tutors", who also take temporary positions at Pinduoduo for on-the-job training to improve their "industrial practical capabilities", avoiding the problem that "teachers can only teach theory but lack understanding of the industry".

For example, when Pinduoduo cooperated with a secondary vocational college in Jiangsu Province, enterprise tutors went to the college every month to offer "Live-Streaming Operation Practical Training Courses" and guide students to

simulate "agricultural product live-streaming sales"; college tutors took temporary positions as "operation assistants" at Pinduoduo, participated in the training of platform merchants, and integrated practical experience into teaching after returning to the college, achieving "mutual improvement between teaching and practice".

5.4 Evaluation synergy: completing the talent evaluation closed loop with enterprise post standards

The "single theoretical assessment" model traditionally adopted by vocational colleges is broken, and Pinduoduo's post competency standards are incorporated into the evaluation system, realizing "alignment between talent evaluation and enterprise recruitment standards":

(1) Integrating Enterprise Tasks into Process-Oriented Evaluation: Students' practical training scores focus on "completing real tasks assigned by Pinduoduo". For instance:

Students specializing in Agricultural Digital Technology are required to "provide digital tool training for 10 rural households and submit a training report";

Students specializing in Rural E-Commerce Operation need to "operate a simulated Pinduoduo store and achieve weekly sales of over 1,000 yuan".

The completion of these tasks is scored by enterprise tutors.

(2) Aligning Summative Evaluation with Enterprise Certification: Pinduoduo's post certification is taken as the core basis for summative evaluation — students must pass certifications such as Pinduoduo's "Junior Agricultural Digital Technician Certification" and "Intermediate Rural E-Commerce Operator Certification" to obtain their graduation certificates. Meanwhile, Pinduoduo provides "priority employment channels" for certified students, directly recommending them to work at cooperative merchants on the platform, thus forming a closed loop of "evaluation - certification - employment".

6 Conclusions and implications

6.1 Conclusions

Taking Pinduoduo's agricultural digitalization strategy as a case study, this paper analyzes the synergy mechanism between an enterprise's long-term strategy and vocational education talent cultivation, and draws the following conclusions:

(1) The core foundation for the synergy between the two lies in "resource complementarity and goal alignment under policy guidance". Pinduoduo's industrial resources (scenarios, experts, data) complement the educational resources of vocational colleges (systems, student pools, hardware). Moreover, the goals of "enterprises addressing talent gaps" and "colleges improving employment quality" are highly consistent, providing a prerequisite for synergy.

(2) The "goal-content-resource-evaluation" four-dimensional mechanism serves as the core path for synergy. By jointly developing post competency standards to anchor goals, embedding industrial scenarios to restructure content, sharing resources via dual tutors and dual bases, and integrating enterprise certification into evaluation, a closed loop of "industrial demand → talent cultivation → post employment" is realized. This solves the problem of "superficial and short-term" collaboration in traditional models.

(3) The synergy mechanism achieves a "triple win" for enterprises, colleges, and society. It not only advances the implementation of Pinduoduo's agricultural digitalization strategy and enhances the professional competitiveness of vocational colleges but also supplies local talents for rural revitalization, demonstrating significant economic and social value.

6.2 Implications

6.2.1 Implications for agricultural digitalization enterprises

Enterprises should incorporate "talent cultivation" into their long-term strategic planning, rather than treating it merely as a "short-term recruitment need". They can learn from Pinduoduo's practices: deeply participate in vocational education through "joint development of post standards, embedding of curriculum content, and sharing of practical training bases" to not only alleviate talent gaps but also reserve long-term talents who "identify with the enterprise ecosystem". Meanwhile, enterprises can leverage policy advantages to reduce participation costs and enhance synergy benefits.

6.2.2 Implications for vocational colleges

Agricultural vocational colleges should break the mindset of "traditional agricultural teaching" and proactively align

with the demands of the agricultural digitalization industry. On one hand, they should connect teaching content with industrial scenarios through "curriculum restructuring and joint development of teaching materials". On the other hand, they should promote teachers' "on-the-job training at enterprises" to improve practical capabilities, avoiding the "disconnection between theory and practice". Additionally, colleges can integrate enterprise certification into their evaluation systems to enhance graduates' job adaptability.

6.2.3 Implications for policy makers

It is recommended to further improve the policy support system for industry-education integration, such as:

Strengthening tax reduction efforts for enterprises participating in agricultural digitalization talent cultivation;

Establishing a "special fund for industry-education integration in agricultural digitalization" to support colleges and enterprises in jointly building practical training bases;

Building a "talent supply-demand docking platform" to break down information barriers between enterprises' job demands and colleges' talent output, and promote the large-scale replication of the synergy mechanism.

Funding

1. Yangzhou Polytechnic University 2025 University-Level Scientific Research Project: "Study on the Adaptability of Professional Structure in Higher Vocational Colleges under the Background of Yangzhou's Pillar Industry Upgrading" (NO: 2025XJ50); 2. Yangzhou Polytechnic University 2025 University-Level Scientific Research Project: "Study on the Digital Transformation of Finance and Business-Related Majors under the Background of Vocational Undergraduate Construction" (NO: 2025XJ22); 3.Yangzhou Polytechnic University 2025 International Exchange Research Project: "Study on the Benchmarking Path of Vocational Undergraduate Education Internationalization Oriented by Industrial Demands" (NO: 2025GJ02); 4. Jiangsu University Philosophy and Social Sciences Research Project for 2025: "Study on the Path of Promoting Higher Vocational College Students' Development and High-Quality Population Development under the Employment Priority Strategy" (NO: 2025SJSZ0979)

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