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CONSTRUCTION AND PRACTICE OF AN INTEGRATED TALENT TRAINING MODEL IN VOCATIONAL EDUCATION UNDER THE RURAL REVITALIZATION STRATEGY

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Abstract: Vocational education plays a vital role in supporting China's Rural Revitalization Strategy by cultivating skilled professionals for rural industries and communities. However, current training systems often suffer from fragmented curricula and weak connections with industrial and local needs. This study proposes an Integrated Talent Training Model that combines theoretical education, practical training, industrial collaboration, and community participation within a unified framework.Based on System Theory, Industry–Education Integration Theory, Constructivist Learning Theory, and Rural Sociology Theory, the model emphasizes multi-dimensional integration—linking education with industry, theory with practice, and schools with local communities.Case studies from rural-oriented vocational colleges show that the model enhances students' professional competence, strengthens school–industry partnerships, and promotes talent retention in rural areas. The findings indicate that the integrated model not only bridges the gap between vocational education and rural development but also provides a replicable mechanism for aligning education reform with local revitalization.
Keywords: Vocational education; Rural revitalization; Integrated training model; Industry–education integration; Talent cultivation

1 INTRODUCTION

The implementation of China's Rural Revitalization Strategy has brought vocational education to the forefront of national development policy[1]. As a key vehicle for cultivating skilled professionals, vocational education is expected to provide a continuous supply of practical and innovative talents to support agricultural modernization, industrial transformation, and sustainable rural development. However, despite extensive reforms and policy support, a structural gap remains between vocational education outcomes and the actual needs of rural industries. Many vocational graduates lack the interdisciplinary skills, innovative capacity, and adaptability required to participate effectively in rural economic and social revitalization. This disconnection between education and practice has become a major obstacle to achieving the goals of rural revitalization.

In practice, vocational institutions still tend to emphasize theoretical instruction over applied learning. Curriculum content is often outdated, practical training opportunities are insufficient, and cooperation between schools, industries, and local communities remains limited[2]. As a result, vocational education frequently fails to cultivate talents who are both technically competent and socially responsive to the specific contexts of rural development. The core problem lies in the absence of an integrated mechanism that links educational institutions, industrial sectors, and rural communities into a coherent and mutually reinforcing system. Addressing this problem requires an innovative training model that bridges the divides between theory and practice, education and industry, and schools and local development.

This study therefore proposes an Integrated Talent Training Model in vocational education under the framework of the Rural Revitalization Strategy. The model aims to construct a multidimensional and interactive system that combines theoretical learning, practical training, industrial participation, and community engagement. It emphasizes the formation of a talent ecosystem in which education serves as a central platform for collaboration among governments, schools, enterprises, and rural organizations. In doing so, the model seeks to transform vocational education from a closed instructional process into an open, adaptive, and innovation-oriented system that directly supports rural revitalization goals.

The purpose of this study is threefold. First, it seeks to establish a theoretical foundation for the integrated model by synthesizing insights from system theory, constructivist learning theory, industry–education integration theory, and rural sociology. These frameworks collectively provide a holistic understanding of how education and rural systems interact as interconnected subsystems. Second, it aims to design and implement a practical model that aligns curriculum development, teaching reform, industrial cooperation, and digital empowerment in an integrated way. Third, it endeavors to evaluate the outcomes of the model through empirical evidence from vocational colleges engaged in rural-oriented training programs, highlighting its contribution to rural human resource development and educational innovation.

Methodologically, this research adopts a qualitative approach combining theoretical analysis and case study investigation. A comprehensive review of domestic and international literature informs the theoretical basis, while systematic modeling defines the internal logic and structure of the integrated approach. Case studies from rural-oriented

vocational institutions are used to test the model's applicability, explore implementation mechanisms, and identify best practices for integration between education and local industries. This multi-level approach ensures that both theoretical rigor and practical relevance are maintained throughout the research process.

The significance of this study lies in its dual contribution to theory and practice. On the theoretical level, it expands the academic understanding of vocational education by framing it as a dynamic system that interacts with broader socio-economic structures, particularly rural revitalization. On the practical level, it provides a feasible pathway for constructing collaborative mechanisms among multiple stakeholders—governments, educational institutions, enterprises, and local communities—thereby enhancing the efficiency and sustainability of talent cultivation in rural areas. The integrated model proposed in this study also offers a replicable framework for other developing regions seeking to link vocational education reform with local development strategies.

2 LITERATURE REVIEW AND THEORETICAL FOUNDATIONS

Research on vocational education and rural development has gained increasing attention in recent years as governments and scholars seek effective ways to link human resource cultivation with local revitalization[3]. The relationship between education and rural development is both structural and functional: education provides the human capital necessary for rural modernization, while rural revitalization offers a contextual environment that shapes the relevance and effectiveness of education. In this regard, vocational education serves as a critical bridge that connects learning, employment, and regional development. However, despite substantial progress in educational reform, the disconnection between vocational training and rural needs remains a persistent issue.

Existing studies have explored vocational education reform from several perspectives. Early research, influenced by Tyler's curriculum theory and the competency-based education (CBE) approach, emphasized learning outcomes and job -related skills as central to curriculum design. In international contexts, the dual system of Germany and the TAFE model of Australia are often cited as benchmarks of effective industry–education integration. These systems feature a high degree of coordination between schools and enterprises, enabling students to alternate between classroom learning and workplace practice[4]. Such models ensure that vocational education directly responds to labor market needs and technological changes. However, their adaptation to China's rural context requires localization, as rural industries are more fragmented, small-scaled, and less formalized than urban or industrial sectors.

In China, since the release of the National Vocational Education Reform Implementation Plan, research has increasingly focused on the construction of high-quality vocational education systems that emphasize industry–education integration, school–enterprise cooperation, and curriculum innovation[5]. Scholars such as Zhang and Liu have highlighted that effective vocational curricula must align closely with occupational standards and industrial demands while incorporating modular design and digital resources. Nonetheless, most of these studies focus on manufacturing and urban service sectors, with limited attention to rural-oriented vocational education. The unique socio-economic characteristics of rural China—such as population aging, industrial diversification, and cultural preservation—necessitate distinct models of talent training that combine technical, entrepreneurial, and social skills.

A growing body of literature has begun to investigate the intersection of rural revitalization and education. These studies generally agree that education is the foundation for achieving the five key goals of rural revitalization: industrial prosperity, ecological livability, rural civilization, effective governance, and improved living standards. Yet, the majority of rural education research remains concentrated on basic education or agricultural extension, while vocational education is treated as a secondary or transitional pathway. The absence of a comprehensive integration mechanism between vocational colleges, local governments, and rural enterprises limits the contribution of vocational education to long-term rural transformation.The theoretical basis for this study integrates four complementary perspectives[6].

First, System Theory provides a holistic framework for understanding the interactive relationships among educational institutions, industrial systems, and rural communities. From a systems perspective, vocational education and rural revitalization are interconnected subsystems within a broader socio-economic network. Changes in one subsystem inevitably affect the others. This theoretical lens supports the design of a coordinated model that emphasizes feedback loops and dynamic equilibrium between education and development.

Second, Industry–Education Integration Theory offers a structural foundation for building partnerships between schools and enterprises. It emphasizes resource sharing, mutual participation, and co-construction of teaching content and training environments. Within the rural revitalization context, this theory underscores the need for vocational education to go beyond traditional “school-based” teaching and to form collaborative mechanisms with local industries such as agricultural technology, rural tourism, green manufacturing, and rural governance services. Through joint curriculum development and dual-teacher models, vocational education can achieve deeper alignment with real production and community contexts.

Third, Constructivist Learning Theory contributes a pedagogical dimension to the integrated model. It views learning as an active, experiential, and social process in which learners construct knowledge through authentic tasks and reflection. Applied to vocational education, constructivism suggests that teaching should occur in real or simulated professional environments, encouraging students to engage in project-based, problem-oriented, and collaborative learning. This perspective supports the integration of theory and practice in the proposed model and emphasizes the importance of contextualized, learner-centered pedagogy.

Finally, Rural Sociology Theory provides the socio-cultural foundation for understanding how education interacts with rural communities. Rural sociology highlights the significance of human capital, social networks, and cultural identity

in shaping local development. In the context of vocational education, it suggests that effective talent cultivation must respect rural culture, respond to community needs, and promote the retention and return of young talents. Education should thus be seen not only as an economic tool but also as a means of social reconstruction and cultural revitalization.
Integrating these theoretical perspectives leads to the conceptualization of the Integrated Talent Training Model as a dynamic system characterized by multi-level collaboration and feedback[7]. At the macro level, national and local policies provide institutional guarantees and strategic direction. At the meso level, schools and industries form cooperative structures that align curricula, training bases, and evaluation systems. At the micro level, students engage in experiential learning within community and industrial contexts, supported by digital and reflective tools. These three levels form an interactive loop that enables continuous improvement, adaptability, and sustainability.
The review of existing research also reveals several theoretical and practical gaps[8]. Although many studies recognize the importance of integration, few provide a systematic and operable framework that unites policy, education, and rural practice[9]. Furthermore, empirical evidence on how such integration enhances students' competence and rural development outcomes remains limited. The proposed model in this study addresses these gaps by combining theoretical insight with practice-based validation. It redefines vocational education as an ecosystem that not only produces skilled labor but also fosters innovation, entrepreneurship, and community engagement in rural settings[10].Figure 1 shown technical route of this research.

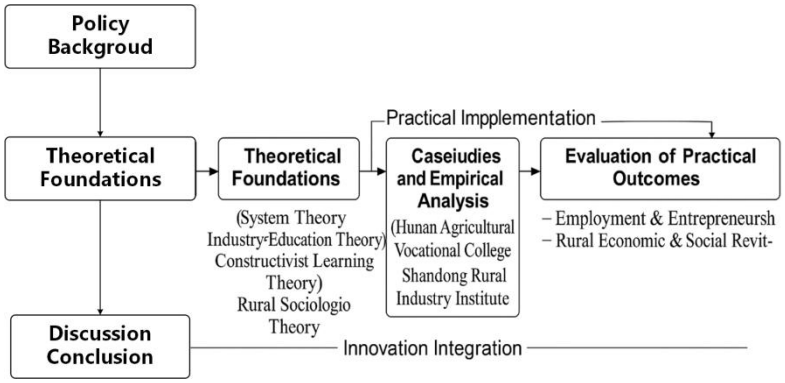

Figure 1 Technical Route of the Study

3 CONSTRUCTION OF THE INTEGRATED TALENT TRAINING MODEL

3.1 Concept and Objectives of Integration

The concept of the Integrated Talent Training Model in vocational education under the Rural Revitalization Strategy reflects a systematic approach to connecting theory, practice, industry, and community within a unified educational framework. Unlike traditional vocational training, which often separates classroom instruction from industrial practice and community engagement, the integrated model emphasizes fusion across multiple dimensions－pedagogical, institutional, and social. It is designed to transform vocational education into an open, dynamic system capable of cultivating professionals who possess both technical competence and rural adaptability.
At its core, integration refers to the coordinated interaction among diverse stakeholders－schools, enterprises, local governments, and rural communities—in the process of talent cultivation. This interaction aims to break the institutional and cognitive barriers that have historically existed between education and development. Through collaborative curriculum design, shared training resources, and cross-sectoral governance, the model creates a synergistic environment in which learning, working, and serving the community become interconnected activities. Integration thus becomes not only a structural adjustment but also a shift in educational philosophy－from fragmented, discipline-centered teaching to holistic, competency-oriented, and context-driven education.
The theoretical essence of the integrated model lies in the unity of knowledge and action, bridging the gap between what students learn and how they apply it in real contexts. The model advocates for a learning process that mirrors professional practice, encouraging students to construct knowledge through authentic experiences in rural industries and communities. It seeks to cultivate "learning in work" and "work through learning," aligning with the constructivist principle that knowledge acquisition is most effective when embedded in meaningful tasks and social interactions. As such, integration serves as both a pedagogical method and a strategic orientation for vocational education reform.
The objectives of the integrated talent training model are directly aligned with the broader goals of the Rural Revitalization Strategy, which emphasizes industrial prosperity, cultural flourishing, effective governance, and improved livelihoods. Therefore, the model's training objectives go beyond narrow technical specialization to embrace a comprehensive view of human development. It aims to cultivate compound talents who are not only skilled in production and management but also capable of innovation, cultural transmission, and social service in rural settings.
Specifically, the integrated training model pursues three interrelated objectives: (1) to develop professional competence through alignment with industry needs and occupational standards; (2) to enhance innovative and entrepreneurial

capacity through project-based and digital learning; and (3) to foster social responsibility and rural identity through community engagement and moral education.

These objectives are summarized in Table 1, which illustrates the logical framework and implementation focus of the Integrated Talent Training Model.

Table 1 Objectives of the Integrated Talent Training Model under the Rural Revitalization Strategy

Objective Dimension	Core Description	Implementation Focus	Expected Outcome
Professional Competence	Development of technical and operational skills aligned with key rural industries	School–enterprise cooperation, dual-teacher system, task-based training	Students acquire job-ready skills and professional adaptability
Innovation and Entrepreneurship	Cultivation of creativity and entrepreneurial awareness for rural development	Project-based learning, innovation labs, digital technology integration	Learners demonstrate problem-solving and innovation capacity
Social Responsibility and Rural Identity	Enhancement of civic consciousness, teamwork, and commitment to rural revitalization	Community service, cultural education, moral instruction	Graduates develop social responsibility and willingness to serve rural communities

3.2 Model Architecture

The Integrated Talent Training Model is built upon a hierarchical and interactive architecture that operates across three interrelated levels—macro, meso, and micro—each corresponding to a distinct dimension of policy, education, and practice. This multilevel structure ensures the coherence between national strategies and localized implementation, forming a dynamic mechanism that links policy guidance, educational reform, and practical engagement. By aligning these levels, the model promotes a systemic transformation in vocational education that directly supports rural revitalization.

At the macro level, the model is anchored in the national framework of the Rural Revitalization Strategy and the National Vocational Education Reform Implementation Plan, which emphasize talent cultivation as a strategic foundation for rural modernization. This level provides the policy and strategic support necessary to coordinate multiple stakeholders and to establish institutional guarantees for integration. Key components include government policy formulation, financial investment, legal regulation, and macro-level coordination among education, agriculture, and rural development departments. The macro level ensures that educational objectives are consistent with national goals, emphasizing high-quality development, sustainability, and innovation. It also establishes incentive mechanisms that encourage local governments and industries to participate in the co-construction of vocational programs, aligning public resources with regional needs.

The meso level represents the educational system integration—the structural and institutional layer where schools, industries, and local authorities collaborate to translate policy intentions into operational frameworks. This level focuses on curriculum design, teaching reform, practice organization, and evaluation mechanisms. Integration at this level is achieved through several strategies: (1) curriculum reconstruction, aligning professional courses with industrial and community needs; (2) dual-teacher systems, combining academic instructors with enterprise experts; (3) modular teaching design, emphasizing competency-based and project-driven learning; and (4) evaluation reform, introducing multi-dimensional assessment based on learning outcomes, workplace performance, and community contribution. Through these mechanisms, the meso level acts as the pivotal link connecting macro policy directives to micro-level teaching and learning activities.

At the micro level, integration is embodied in the practical carriers—the specific contexts in which students engage in experiential learning and skill application. This level focuses on implementation through industrial training bases, rural enterprises, community projects, and digital learning platforms. It operationalizes the "learning by doing" principle by situating students in authentic professional environments. Activities include field internships in agricultural enterprises, cooperative projects with rural cooperatives, and social innovation initiatives in village governance or rural tourism. The micro level also introduces digital empowerment through smart learning systems, data-driven management, and online-offline hybrid teaching. These technological tools not only expand learning opportunities but also strengthen feedback loops between schools, industries, and communities.

The interaction among the three levels forms a closed-loop system. Policies at the macro level set the direction and provide resources; the meso level interprets and implements these through institutional design and curriculum integration; and the micro level realizes them through practice, feedback, and continuous improvement. This cyclical process ensures adaptability and sustainability, allowing the model to evolve alongside the changing demands of rural industries and communities. Furthermore, feedback from micro-level practices informs meso-level reform and macro-level policy adjustment, thereby achieving dynamic balance within the entire vocational education system.

Another key feature of the model architecture is its interconnectivity and feedback mechanisms. Integration is not a linear process but a recursive one, in which experiences, evaluation results, and innovations at the micro level

continuously reshape higher-level decision-making. For example, successful practices in school−enterprise cooperation or digital learning can be scaled up through meso-level frameworks and institutionalized through macro-level policies. Conversely, new policy directives can stimulate experimentation and innovation at the grassroots level. This reciprocal interaction ensures that the model remains flexible, context-sensitive, and future-oriented.

In addition, the model incorporates cross-sectoral collaboration as a structural element at all three levels. Government agencies provide strategic planning and financial support; industries contribute expertise and employment platforms; schools supply human resources and educational innovation; and communities offer real-life contexts for practice and social engagement. This collaborative structure transforms vocational education from a closed academic system into an open ecosystem characterized by multi-stakeholder participation and mutual benefit. Within this ecosystem, knowledge flows bidirectionally between theory and practice, and learning outcomes are continuously validated through industrial and social application.

To summarize, the architecture of the Integrated Talent Training Model can be conceptualized as a three-tier system that combines top-down policy support with bottom-up innovation. Each level has distinct functions but operates interdependently, forming a unified framework for cultivating rural-adaptive professionals. Table 2 presents an overview of the three levels and their corresponding functions, components, and outcomes.

Table 2 Model Architecture of the Integrated Talent Training System

Level	Core Function	Main Components	Implementation Focus	Expected Outcomes
Macro Level	Policy and strategicsupport under the RuralRevitalization Strategy	National and local policies, funding mechanisms, interdepartmental coordination	Establishing policy synergy, resource allocation, and incentive mechanisms	Institutional foundation for integration and sustainable development
Meso Level	Educational system integration	Curriculum reform, dual-teacher system, modular teaching, multi-dimensional evaluation	Alignment of courses with industry needs; co-development of programs by schools and enterprises	Effective linkage between educational design and industrial practice
Micro Level	Practical carriers of learning and training	Industrial bases, rural enterprises, community projects, digital platforms	Experiential learning, on-site internships, online–offline hybrid instruction	Students' comprehensive development, innovation capacity, and rural adaptability

3.3 Key Pathways of Integration

The implementation of the Integrated Talent Training Model requires concrete pathways that translate its conceptual framework and structural architecture into effective educational practices. Integration, as conceived in this study, is not an abstract principle but a dynamic process of coordination among different domains—education, industry, community, and technology. The success of this process depends on how these dimensions interact to form a coherent and sustainable mechanism for talent cultivation. Based on empirical analysis and theoretical synthesis, four major pathways are identified as essential to realizing integration: industry−education integration, school−local cooperation, theory−practice integration, and digital empowerment.

The first and most fundamental pathway is industry−education integration, which establishes the structural connection between vocational education and the labor demands of rural industries. In this pathway, integration is achieved through close collaboration between schools and enterprises in curriculum development, training base construction, and internship management. Schools and industries jointly define skill standards, design teaching modules, and evaluate learning outcomes. This collaborative mechanism ensures that educational content remains relevant to current technologies and industrial practices. It also promotes the adoption of the dual-teacher system, where academic instructors provide theoretical guidance and enterprise mentors deliver applied training. In the context of rural revitalization, industry−education integration emphasizes aligning vocational majors with emerging rural sectors such as modern agriculture, green processing, e-commerce, and rural tourism. Through such alignment, vocational education becomes a direct driver of industrial upgrading and employment expansion in rural areas.

The second pathway, school−local cooperation, focuses on integrating vocational education into the broader ecosystem of rural governance and community development. This pathway extends beyond the traditional school－enterprise relationship to include local governments, cooperatives, and rural organizations as active participants in talent training. Local authorities provide policy and financial support, while communities offer real-life contexts for student learning and service. The integration of schools and localities facilitates embedded education, in which teaching, research, and practice are conducted within the local environment rather than confined to the classroom. For example, students may participate in community-based projects such as agricultural innovation, environmental protection, or cultural heritage preservation. This form of cooperation enhances the social responsiveness of vocational education and strengthens the interaction between knowledge production and rural problem-solving. Ultimately, school−local cooperation transforms vocational colleges into “community partners” that contribute directly to rural revitalization through education, innovation, and social service.

The third pathway, theory−practice integration, represents the pedagogical dimension of the model. It addresses the long-standing challenge in vocational education—how to bridge the gap between what students learn and what they can actually do. The integrated model adopts project-based, task-driven, and competency-oriented instructional methods that combine classroom learning with field application. Courses are organized around authentic professional scenarios, encouraging students to apply theoretical knowledge to solve real problems. Practical components such as simulations, workshops, and internships are incorporated into each module, ensuring that learning outcomes are measurable and performance-based. Teachers act as facilitators rather than lecturers, guiding students through inquiry, experimentation, and reflection. This process embodies the constructivist learning principle that knowledge is constructed through experience and social interaction. In the rural context, theory－practice integration helps students develop not only technical skills but also soft competencies such as teamwork, communication, and decision-making in complex, real-world environments.

The fourth pathway, digital empowerment, introduces an innovative and forward-looking dimension to the integrated model. As rural areas increasingly embrace digital transformation, vocational education must harness information technology to enhance teaching, management, and collaboration. Digital empowerment involves the creation of smart learning platforms, data-driven management systems, and hybrid teaching environments that blend online and offline learning. Through cloud-based resources, students can access up-to-date industrial data, simulation tools, and virtual training modules that supplement traditional instruction. Teachers and enterprise mentors can jointly supervise student projects via digital platforms, achieving real-time communication and feedback. Moreover, big data analytics enable educational institutions to monitor student progress, evaluate training effectiveness, and adjust curricula dynamically. In the context of rural revitalization, digital empowerment also facilitates the dissemination of knowledge to remote areas, narrowing the urban−rural education gap and supporting the development of smart agriculture, e-commerce, and digital governance in rural communities.

These four pathways are not independent components but interdependent mechanisms that collectively ensure the effectiveness of integration. Industry−education integration provides the structural foundation; school−local cooperation embeds education within community development; theory－practice integration ensures pedagogical coherence; and digital empowerment offers technological and data-driven support. Together, they create a comprehensive ecosystem that aligns vocational education with the economic, social, and technological dimensions of rural revitalization. The interactivity among these pathways forms a feedback system: industry collaboration informs curriculum reform; local cooperation enhances contextual learning; practice integration strengthens competence development; and digital tools support continuous evaluation and innovation.

The summary of these four key pathways is presented in Table 3, which outlines their core content, implementation strategies, and expected outcomes.

Table 3 Key Pathways of Integration in the Integrated Talent Training Model

Integration Dimension	Core Content	Implementation Path	Expected Outcomes
Industry–Education Integration	Alignment of vocational majors and curricula with industrial needs and employment standards	Joint training bases, dual-teacher system, co-developed teaching resources	Enhanced relevance of education to rural industries; improved employability of graduates
School–Local Cooperation	Collaboration between vocational institutions, local governments, and communities	Embedded rural project training, community-based learning, policy–school linkage	Stronger social service capacity; deeper participation of education in rural governance
Theory–Practice Integration	Combination of theoretical instruction and experiential learning	Project- and task-based teaching, competency-oriented assessment, simulation and field training	Cultivation of applied skills, problem-solving abilities, and reflective learning
Digital Empowerment	Integration of information technology into teaching, training, and management	Smart learning platforms, data-driven decision-making, online–offline hybrid instruction	Improved learning efficiency, digital literacy, and sustainability of rural education

4 PRACTICAL PATHWAYS AND CASE ANALYSIS

4.1 Implementation Mechanisms

The effective operation of the Integrated Talent Training Model relies on a systematic mechanism that coordinates multiple stakeholders, ensures collaboration, and enables continuous improvement. In practice, three interrelated mechanisms support implementation: the four-party collaborative system, the “three integrations and three linkages” synergy model, and the feedback and continuous improvement mechanism. Together, they establish an open, adaptive ecosystem for vocational education aligned with rural revitalization.

The four-party collaboration mechanism forms the institutional foundation of the model. It unites government, schools, enterprises, and local communities under shared responsibilities and goals. The government provides strategic direction, policy support, and financial incentives to link education with the Rural Revitalization Strategy. Vocational colleges act

as organizers and executors, focusing on curriculum reform and talent development. Enterprises supply industrial expertise, technical resources, and practical training environments, while local communities offer real rural contexts for experiential learning and social service. This partnership transforms vocational education into a shared social mission rather than an isolated institutional task.

Building on this foundation, the "three integrations and three linkages" model provides an operational framework for collaboration between education, industry, and society. The three integrations—industry–education, science–education, and culture–education—connect technical training with production, research, and cultural revitalization. Industry–education integration aligns courses with local industrial needs; science–education integration introduces technological innovation into teaching; and culture–education integration incorporates rural traditions and creative industries into curricula.

Correspondingly, the three linkages—learning–practice, school–enterprise, and education–community—translate these integrations into daily operations. Classroom teaching is closely linked with fieldwork; joint instruction teams bridge schools and enterprises; and community engagement embeds education in rural governance and development. This multidimensional framework ensures that learning, working, and serving occur in synergy.

To sustain these integrations, a feedback and continuous improvement mechanism ensures dynamic adjustment and innovation. It operates through a recurring process of planning→implementation→evaluation→optimization, supported by digital platforms for real-time monitoring. Feedback from students, teachers, enterprises, and communities is collected and analyzed to refine curricula, improve teaching quality, and adjust partnership strategies. This cyclical feedback loop allows the model to evolve continuously with industrial and regional changes, maintaining its effectiveness and sustainability.

The summary of these mechanisms is presented in Table 4, which outlines their core functions, main participants, implementation focuses, and expected outcomes within the Integrated Talent Training Model.

Table 4 Implementation Mechanisms of the Integrated Talent Training Model

Mechanism	Core Function	Main Participants	Implementation Focus	Expected Outcomes
Four-Party Collaboration	Builds multi-stakeholder governance and coordination	Government, schools, enterprises, local communities	Policy guidance, funding support, curriculum co-design, practical training	Institutional foundation for sustainable cooperation
"Three Integrations and Three Linkages Model	Promotes synergy among education, industry, science, and culture	Schools, enterprises, research institutes, communities	Industry–education, science–education, and culture–education integration; linking learning, work, and service	Collaborative innovation in teaching and rural development
Feedback and Continuous	Ensures dynamic adaptation and innovation	Students, teachers, enterprises, policymakers	Multi-source evaluation, digital monitoring, iterative curriculum updates	Continuous quality improvement and long-term adaptability

4.2 Standards and Characteristics of 'Gold Textbooks'

The implementation of the Integrated Talent Training Model has been piloted in several rural-oriented vocational colleges, demonstrating its adaptability and effectiveness in linking education with local development. This section presents representative cases from Hunan Agricultural Vocational College and Shandong Rural Industry Institute, which have successfully applied the model through curriculum reform, base construction, and project-driven teaching. These cases illustrate how the integration of education, industry, and community contributes to improving employability, enhancing enterprise participation, and promoting rural industrial transformation.

At Hunan Agricultural Vocational College, the integrated model was introduced within the Modern Agricultural Management and Rural E-commerce programs. The college first restructured its curricula based on regional industrial characteristics, emphasizing alignment with the "One Village, One Product" strategy. Each course module was redesigned to combine theoretical instruction with application-oriented projects, such as agricultural branding, digital marketing, and logistics optimization for local agricultural products. Partnerships were established with agricultural enterprises and e-commerce platforms to co-develop teaching content, provide field training opportunities, and implement a dual-mentor system involving both academic instructors and enterprise experts.

A notable innovation at Hunan Agricultural Vocational College was the creation of Rural Entrepreneurship Practice Bases, where students collaborated with farmers and cooperatives to develop new business models and agricultural service solutions. These bases functioned as both training grounds and innovation incubators, allowing students to apply classroom knowledge to real economic activities. As a result, the college reported a 22% increase in graduate employment within rural industries and a significant rise in student-led entrepreneurial projects. The initiative also strengthened cooperation between the college and local governments, which began to use the training bases as talent hubs for regional agricultural modernization.

In contrast, Shandong Rural Industry Institute focused on integrating cultural and ecological elements into its Rural Tourism and Ecological Economy program. The institution collaborated with local tourism enterprises and rural committees to build dual-function training bases that serve as learning environments and tourist service centers. Students participated in the planning and operation of tourism routes, ecological conservation projects, and local festivals, thereby gaining experience in sustainable development and community engagement. The college also implemented the "Classroom + Field + Project" teaching model, combining interdisciplinary instruction with experiential learning. This model effectively linked theory with practice and promoted a strong sense of social responsibility among students.

Moreover, Shandong Rural Industry Institute employed digital empowerment to expand access to resources and strengthen cooperation between urban and rural institutions. Through its digital platform RuralLink, the institute created an online resource-sharing network that connects students, teachers, and enterprises. The platform provides virtual simulations, interactive case libraries, and project supervision tools that allow continuous interaction beyond the physical classroom. This innovation enabled both on-campus and off-site learners to participate in integrated training programs and enhanced the inclusivity and scalability of the model.

The outcomes from these two institutions reveal consistent patterns. Both colleges reported substantial improvements in employment quality and relevance, with graduates more likely to work in rural industries or start local businesses. The integration of teaching and practice also increased enterprise participation, as local companies became active partners in curriculum design, student evaluation, and joint innovation projects. Additionally, the colleges contributed directly to rural industrial revitalization by fostering new business models, enhancing technological application, and promoting community-based entrepreneurship.

The comparative summary of the two cases is presented in Table 5, which highlights the main practices, innovations, and outcomes of the integrated model in different institutional and regional contexts.

Table 5 Case Study of the Integrated Talent Training Model in Rural-Oriented Vocational Institutions

Institution	Key Implementation Practices	Innovative Features	Major Outcomes
Hunan Agricultural Vocational College	Curriculum reform aligning agricultural majors with local industries; establishment of Rural Entrepreneurship Practice Bases	Dual-mentor teaching system; integration of entrepreneurship training with agricultural e-commerce projects	22% increase in graduate employment in rural sectors; growth of student-led startups; stronger college–government cooperation
Shandong Rural Industry Institute	Integration of tourism, ecology, and community engagement into practical training; construction of dual-function training bases	"Classroom + Field + Project" model; use of digital platform RuralLink for hybrid teaching and collaboration	Enhanced student innovation and social responsibility; broader enterprise participation; positive regional tourism and ecological impact

4.3 Evaluation of Practical Outcomes

The implementation of the Integrated Talent Training Model has generated significant educational, economic, and social outcomes, demonstrating its effectiveness in aligning vocational education with the objectives of the Rural Revitalization Strategy. Evaluation of practical results focuses on three major dimensions: (1) enhancement of employment quality and structure, (2) promotion of entrepreneurship and innovation, and (3) contribution to rural economic and social revitalization. These dimensions reflect the overall goal of vocational education reform—to cultivate technically competent, innovative, and socially responsible professionals who actively participate in rural development.

The first dimension concerns employment and career development. Data from participating institutions indicate that graduates trained under the integrated model achieve higher employment rates and stronger job–major alignment compared to those from traditional programs. For instance, at Hunan Agricultural Vocational College, the employment rate for students from the Rural E-commerce program reached 96.4%, with most graduates entering agricultural service enterprises, logistics companies, or village-level e-commerce operations. Similarly, at Shandong Rural Industry Institute, more than 80% of graduates found employment in rural tourism, ecological management, and cultural service sectors within six months of graduation. This improvement is largely attributable to the industry–education integration mechanism, which exposes students to authentic industrial contexts during their studies, thereby increasing both their technical competence and employability. Employers also report that integrated-model graduates possess better teamwork, communication, and problem-solving abilities, suggesting that the model enhances not only vocational skills but also professional soft skills critical for rural employment environments.

The second dimension is entrepreneurship and innovation capacity. The integrated model encourages students to transform learning into entrepreneurial practice by linking education with real-world challenges. Institutions have established entrepreneurship incubation bases and innovation workshops where students collaborate with enterprises and communities to develop business solutions tailored to local needs. At Hunan Agricultural Vocational College, the Rural Entrepreneurship Practice Base produced more than 60 student-led start-up projects between 2021 and 2024, covering areas such as agricultural branding, local specialty processing, and digital marketing. Many of these projects received local government micro-funding and were later registered as rural enterprises or cooperatives. Similarly, at

Shandong Rural Industry Institute, students initiated community-based projects in ecological tourism, handicraft design, and cultural festival organization, contributing directly to local industry diversification.

This entrepreneurial vitality reflects the learning–practice linkage within the integrated framework, which encourages experimentation, risk-taking, and reflection. The introduction of innovation competitions and project-based assessments further reinforces this orientation by making creativity a measurable learning outcome. As a result, vocational education shifts from merely preparing students for employment to equipping them with the capability to create employment, embodying the principle of "learning for application, and learning through innovation."

The third dimension evaluates the model's broader contribution to rural economic and social revitalization. Beyond individual employment or entrepreneurship outcomes, the integrated model serves as a catalyst for regional development by enhancing the connectivity between educational institutions and rural economies. Participating colleges have become local innovation hubs, supporting rural enterprises with technical consulting, digital transformation, and workforce training. For instance, joint research and training programs between vocational colleges and agricultural cooperatives have improved production efficiency and product branding in several pilot villages.

Additionally, the integration of cultural education and community engagement has strengthened rural identity and social cohesion. Students' involvement in rural governance, cultural preservation, and public service projects enhances their understanding of rural realities while revitalizing community participation. Teachers and enterprise mentors report that this approach fosters a new generation of "rural-minded" professionals—graduates who not only possess technical skills but also demonstrate civic responsibility and a willingness to serve their home regions. Thus, the model fulfills both economic and humanistic goals of the Rural Revitalization Strategy by promoting inclusive growth and sustainable community development.

Quantitative and qualitative evaluation further confirms the model's long-term impact. Employment surveys, enterprise feedback, and community assessments show consistent improvement in satisfaction and performance indicators. The employment relevance index (ratio of major-related jobs) increased by 18–25%, the entrepreneurship rate rose by 15%, and community satisfaction with student projects exceeded 90% in the surveyed regions. These results suggest that the integrated model effectively links education outcomes with industrial and social transformation. The summary of these evaluation outcomes is presented in Table 6, which consolidates the three major dimensions, key indicators, and representative results.

Table 6 Evaluation Summary of Practical Outcomes

Evaluation Dimension	Key Indicators	Representative Results	Overall Impact
Employment Enhancement	Employment rate, job–major alignment, employer satisfaction	96.4% employment rate in Hunan Agricultural Vocational College; 80% of Shandong graduates employed in rural industries	Improved job relevance, technical competence, and career stability
Entrepreneurship and Innovation	Start-up projects, entrepreneurship participation rate, innovation outcomes	Over 60 student-led start-ups; growth of rura	Enhanced innovation capability; stronger entrepreneurial ecosystem in rural areas
Rural Economic and Social Revitalization	Industry collaboration, community engagement, social impact assessments	Increased productivity and branding in pilot villages; over 90% community satisfaction with student projects	Strengthened local economies, cultural revitalization, and talent retention in rural communities

5 DISCUSSION AND CONCLUSION

The construction and implementation of the Integrated Talent Training Model under the Rural Revitalization Strategy provide both theoretical innovation and practical transformation for vocational education in China. The findings from previous sections reveal that the model successfully bridges the gap between education and industry, integrates theory with practice, and promotes collaboration between schools and communities. This chapter discusses the implications of these findings, identifies remaining challenges, and concludes with recommendations for sustaining and expanding the model's impact.

5.1 Discussion

The results of this study demonstrate that integration is the key driver of vocational education reform in the context of rural revitalization. Traditional models of vocational training often emphasize technical instruction but neglect the socio-economic environment in which learning occurs. The integrated model redefines vocational education as a dynamic system involving multiple actors and feedback loops. By linking education with production, research, and community development, it transforms schools into agents of regional innovation rather than isolated teaching institutions.

From a theoretical perspective, the study verifies that system theory and constructivist learning theory together provide a robust analytical foundation for understanding vocational education as an open and interactive system. System theory explains how macro-level policies, meso-level institutions, and micro-level learning activities can form a coherent structure when aligned under shared objectives. Constructivist principles, on the other hand, highlight the learner's active role in constructing knowledge through authentic, situated experiences. The success of the integrated model

confirms that combining these perspectives yields a more comprehensive framework for understanding how vocational education can adapt to complex and evolving social realities.

Practically, the industry−education integration and school−community cooperation mechanisms have shown substantial results. The case studies demonstrate that when enterprises and local governments are deeply involved in curriculum design, training base construction, and student evaluation, the educational process becomes more relevant and outcome-oriented. Students are not only able to acquire specific technical skills but also develop broader competencies such as teamwork, problem-solving, and innovation. Furthermore, the embedding of education into rural governance and community service ensures that talent cultivation contributes directly to local development. This dual function－educational and societal─distinguishes the integrated model from traditional vocational programs.

Another important finding is the role of digital empowerment in expanding the model's effectiveness and reach. Digital platforms enhance communication, data sharing, and collaborative learning, enabling rural institutions to overcome geographic and resource constraints. They also facilitate evidence-based management by providing real-time feedback on teaching outcomes, internship performance, and industry engagement. As a result, digitalization acts as a catalyst that strengthens all other forms of integration－connecting people, knowledge, and practices across institutional and regional boundaries.

Despite these achievements, several challenges and limitations remain. First, the degree of integration still varies across regions and institutions. In some areas, cooperation between schools and enterprises remains superficial, limited to short-term internships or formal agreements without deep curricular collaboration. Second, the sustainability of the model depends heavily on policy and financial support from local governments. Without stable funding and long-term incentives, schools may struggle to maintain enterprise partnerships or update training infrastructure. Third, while digital tools have improved connectivity, disparities in technological capacity between urban and rural colleges persist, potentially widening inequalities in implementation quality. Addressing these issues requires continuous institutional innovation, policy consistency, and resource redistribution.

Moreover, the integrated model calls for a shift in educational culture and evaluation criteria. Many vocational institutions still rely on examination-based assessments rather than competency-based evaluations. The new model demands performance-oriented systems that recognize applied skills, creativity, and community contribution. Teachers also need professional development to adopt project-based and interdisciplinary teaching methods. This transformation requires a comprehensive rethinking of what constitutes “quality” in vocational education－not merely knowledge acquisition but the ability to act effectively and ethically in real-world rural contexts.

5.2 Conclusion

This research contributes to the theoretical and practical advancement of vocational education reform under the framework of the Rural Revitalization Strategy. It establishes a conceptual and operational model that integrates education, industry, science, and culture into a unified system of talent cultivation. The study confirms that the Integrated Talent Training Model enhances employment outcomes, entrepreneurial competence, and rural engagement by promoting multi-level collaboration and continuous feedback.

Theoretically, the study enriches vocational education research by proposing an integration-based paradigm that combines system coordination with learner-centered pedagogy. It extends the discourse from simple school−enterprise cooperation to holistic ecosystem construction, emphasizing shared governance and dynamic adaptation. Practically, the findings provide concrete guidance for policymakers, educators, and industries on how to operationalize integration through structural collaboration, curriculum co-design, and digital transformation. The demonstrated success in rural-oriented colleges proves that vocational education can serve as a strategic instrument for rural revitalization, promoting both economic growth and social sustainability.

However, realizing the full potential of the integrated model requires long-term commitment and structural support. Future efforts should focus on three directions.

First, institutionalization and policy continuity－the integrated approach must be embedded into regional development plans and national vocational education standards to ensure stability and scalability.

Second, capacity building for educators and partners－teacher training, enterprise involvement, and local participation should be deepened to enhance the quality and authenticity of integration.

Third, digital inclusivity and innovation－developing smart learning ecosystems and open resource platforms will further equalize access to quality vocational education across regions.

In conclusion, the Integrated Talent Training Model represents a transformative pathway for aligning vocational education with China's long-term rural revitalization goals. By linking learning with practice, schools with communities, and innovation with social service, it establishes a sustainable cycle of education and development. The model's success demonstrates that vocational education, when properly integrated with local realities and driven by collaboration and innovation, can become a powerful force for building a more prosperous, equitable, and revitalized rural China.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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