

The Research on Pathways for Cultivating Innovative and Entrepreneurial Talents in Higher Vocational Agricultural Education

Weiming Kuang

Yongzhou Vocational Technical College, Yongzhou, Hunan, 425000, China

ABSTRACT

Innovation and entrepreneurship education represents a cornerstone of contemporary educational reform initiatives. The strategic integration of entrepreneurial learning frameworks into professional curricula within higher vocational institutions serves to cultivate students' innovative cognitive processes, practical competencies, and entrepreneurial attributes. Within the contemporary context of implementing comprehensive rural revitalization strategies and advancing vocational education reform, higher vocational agricultural education assumes the critical responsibility of developing high-caliber innovative and entrepreneurial agricultural professionals. This research, grounded in higher vocational agricultural professional education, investigates the systematic integration of professional education with innovation and entrepreneurship education, proposing comprehensive pathways for cultivating innovative and entrepreneurial talents within agricultural specializations. Through rigorous analysis of specific initiatives encompassing professional curriculum reform, practical platform development, industry-academia collaboration, and research-driven empowerment, this study synthesizes feasible implementation models and strategic approaches. The research aims to provide substantive reference frameworks for cultivating innovative and entrepreneurial agricultural talents within higher vocational institutions.

KEYWORDS

Higher vocational agricultural education; Agricultural talent development; Rural revitalization

1 Introduction

The fundamental talent cultivation objective of higher vocational institutions centers on producing highly skilled, application-oriented professionals equipped to meet contemporary industry demands. Within the agricultural sector, the advancement of comprehensive rural revitalization strategies in the modern era has generated urgent societal demand for a cadre of entrepreneurial agricultural professionals who demonstrate technical proficiency, managerial acumen, and innovative capabilities. Talent development constitutes the foundational element driving successful rural revitalization initiatives, thereby underscoring the critical importance of cultivating innovative and entrepreneurial agricultural professionals for agricultural modernization and rural development advancement.

Simultaneously, vocational education systems are experiencing comprehensive reform transformations that provide strategic direction and institutional support for deepening entrepreneurship education initiatives within higher vocational agricultural programs. However, contemporary agricultural higher vocational institutions continue to exhibit significant deficiencies in entrepreneurship education delivery, necessitating systematic exploration of methodologies for organically integrating professional education with entrepreneurship education to develop cultivation models specifically tailored to agricultural specializations.

This research, focusing on agricultural higher vocational specializations, analyzes comprehensive approaches for integrating professional education with entrepreneurship education. The investigation emphasizes training pathways encompassing curriculum reform, practical instruction methodologies, industry-academia collaboration frameworks, and research integration strategies. The study provides evidence-based strategies for enhancing innovative and entrepreneurial capabilities among students pursuing agricultural higher vocational specializations, contributing to the broader objectives of agricultural modernization and rural development.

2 Strategic framework for integrating professional education with entrepreneurship education

The systematic integration of professional education with entrepreneurship education constitutes the fundamental prerequisite for cultivating innovative and entrepreneurial talent within higher vocational institutions. Agricultural higher vocational specializations must comprehensively leverage their professional learning processes while systematically incorporating entrepreneurship education components throughout their curricula, thereby enhancing students' entrepreneurial awareness and capabilities during their academic tenure.

2.1 Development of specialization-based entrepreneurship education systems

The construction of entrepreneurship education systems grounded in agricultural professional knowledge requires the systematic integration of entrepreneurship education into specialized curricula and instructional processes. Utilizing entrepreneurship courses as pedagogical vehicles, institutions should design entrepreneurial projects that closely align

with agricultural production realities while addressing the distinctive characteristics of agricultural specializations. This approach enables students to engage in authentic entrepreneurial practice while completing their specialized coursework requirements.

The implementation of micro-entrepreneurial projects within plant production courses exemplifies this integration strategy. Students can simulate comprehensive entrepreneurial processes for specific crops, encompassing all phases from seedling cultivation through market distribution. This methodology facilitates simultaneous delivery of entrepreneurial knowledge and specialized professional knowledge, enabling students to acquire technical competencies while accumulating practical entrepreneurial experience and developing entrepreneurial capabilities.

Furthermore, the integration process should incorporate contemporary agricultural technologies and sustainable farming practices, exposing students to cutting-edge developments in precision agriculture, biotechnology applications, and environmental stewardship principles. This comprehensive approach ensures that entrepreneurial ventures are grounded in both traditional agricultural wisdom and innovative technological solutions.

2.2 Development of professional competency-based entrepreneurial activities

Students' professional competencies serve as the foundational basis for their innovative entrepreneurial endeavors. Vocational agricultural education programs should design targeted campus-based and external entrepreneurial practice activities that build upon the specific skills and competencies inherent to agricultural specializations, thereby strengthening students' application of professional skills while cultivating entrepreneurial awareness.

Educational institutions should systematically organize professional skills competitions, agricultural product creative design contests, and campus entrepreneurship exhibitions to provide students with substantive opportunities to apply their professional knowledge in practical contexts. These activities require students to utilize their agricultural expertise for solving real-world challenges, developing innovative products, or optimizing production processes, thereby enhancing their innovative thinking capabilities and entrepreneurial skills through experiential learning.

The scope of these activities should extend beyond traditional agricultural practices to encompass emerging sectors such as agtech innovation, sustainable agriculture solutions, food security technologies, and rural digital transformation initiatives. This expanded focus prepares students to engage with contemporary challenges facing the agricultural industry while developing entrepreneurial solutions that address both local and global agricultural needs.

2.3 Development of specialization-specific entrepreneurial environments

The cultivation of robust innovation and entrepreneurship atmospheres proves essential for inspiring students' entrepreneurial enthusiasm and commitment. Vocational institutions should, in consideration of the distinctive characteristics of agricultural specializations, foster comprehensive cultural environments on campus that facilitate entrepreneurship education delivery. This objective can be achieved through promoting entrepreneurial support policies aligned with rural revitalization initiatives and regularly inviting successful alumni to deliver inspirational lectures and mentorship sessions.

Additionally, institutions should strengthen faculty development programs, integrating entrepreneurial thinking methodologies into professional instruction and guiding students toward the systematic integration of professional studies with entrepreneurial practice. The development of innovation hubs, maker spaces, and agricultural technology laboratories provides physical infrastructure supporting entrepreneurial experimentation and prototype development.

The entrepreneurial environment should also incorporate partnerships with local agricultural businesses, government agencies, and rural development organizations to create authentic learning experiences that connect academic learning with real-world agricultural challenges and opportunities.

3 Comprehensive pathways for cultivating innovative and entrepreneurial talents in agricultural education

The development of systematic pathways for cultivating innovative and entrepreneurial talent within agricultural specializations in vocational institutions requires comprehensive design encompassing instructional philosophies, curriculum architecture, and practical platform development. Agriculture constitutes a foundational industry within the national economic framework, making the cultivation of innovative and entrepreneurial talent in the agricultural sector critically important for supporting rural revitalization and agricultural modernization objectives.

3.1 Integration of entrepreneurial education elements within professional courses

Agricultural courses contain abundant innovative and entrepreneurial elements that require systematic identification and pedagogical development. The critical factor lies in faculty members' ability to explore and effectively guide these elements throughout their instructional delivery. When teaching specialized professional knowledge, students should proactively connect learning content to the comprehensive agricultural industry chain and entrepreneurial practices,

enabling them to understand how their professional knowledge can be strategically applied within entrepreneurial contexts.

In specialized courses such as vegetable cultivation or plant protection, faculty can assign team-based entrepreneurial practice projects requiring students to simulate the comprehensive creation of agricultural enterprises. These assignments should encompass the entire operational process from variety selection and production management through product marketing and financial analysis, including detailed input and output calculations. Through this comprehensive process, students master essential professional technical skills while experiencing the operational dimensions of agricultural entrepreneurship, achieving effective integration of theoretical knowledge with practical application.

The integration process should also incorporate contemporary challenges such as climate change adaptation, sustainable resource management, and digital agriculture technologies. Students should develop entrepreneurial solutions that address these contemporary challenges while building upon fundamental agricultural principles and practices.

3.2 Agricultural curriculum reform for enhanced entrepreneurial orientation

Higher vocational agricultural education must systematically eliminate the traditional separation between theoretical and practical instruction while strengthening students' entrepreneurial orientation and practical capabilities through comprehensive curriculum reform initiatives. The establishment of curriculum systems that effectively integrate theory and practice requires increasing the proportion of practical instruction and systematically incorporating entrepreneurial projects and case studies throughout professional courses to achieve synchronization between classroom instruction and entrepreneurial practice.

Faculty should adopt project-based instructional methodologies, organizing entire semesters around comprehensive projects that integrate the complete spectrum of production and learning processes. This approach enables students to learn through active engagement while enhancing their practical competencies. Leveraging campus-based agricultural training facilities, student teams can be organized to complete comprehensive training projects encompassing all phases from planting plan development through cultivation management and product marketing. The entire process simulates authentic entrepreneurial experiences, enabling students to master diverse competencies in cultivation techniques and business management through practical application.

Exploratory initiatives and practical implementations at selected higher vocational institutions have demonstrated that such comprehensive reforms can significantly enhance students' entrepreneurial capabilities and prepare them for successful careers in agricultural entrepreneurship. The curriculum reform should also incorporate emerging technologies such as precision agriculture, drone applications, IoT sensors, and data analytics to ensure students are prepared for the increasingly technology-driven agricultural sector.

3.3 Provision of diversified entrepreneurial practice pathways

Higher vocational institutions should systematically integrate both campus-based and external resources to provide comprehensive entrepreneurial practice pathways for agricultural students. Through strategic industry-academia collaboration, students can establish practical training bases within enterprises and rural grassroots organizations, developing their entrepreneurial competencies within authentic operational environments.

Campus-based entrepreneurial incubation centers should be established to provide physical workspace, expert mentorship, and financial support resources that encourage student teams to develop and incubate entrepreneurial projects. Furthermore, institutions should regularly conduct innovation and entrepreneurship competitions and project showcase events to promote collaborative learning and practical application, thereby enhancing students' entrepreneurial qualities and practical capabilities.

The utilization of diverse policy resources available through Rural Revitalization Strategy initiatives should guide students toward agricultural entrepreneurship opportunities. Government entities at various administrative levels have implemented comprehensive support programs for college graduates returning to their communities to establish businesses and develop new professional farming operations, creating supportive environments for higher vocational graduates to engage in agricultural entrepreneurship.

These pathways should also include international exchange programs, study abroad opportunities, and partnerships with global agricultural organizations to expose students to international best practices and global market opportunities in agricultural entrepreneurship.

3.4 Leveraging agricultural scientific research for entrepreneurship promotion

The systematic encouragement of student participation in agricultural scientific research and innovation initiatives enables the transformation of new professional technologies and research findings into viable entrepreneurial projects. This approach empowers students to engage in entrepreneurial practice with enhanced professional perspectives and

advanced methodological approaches. Research participation should encompass diverse areas including crop improvement, sustainable farming practices, agricultural technology development, and rural innovation solutions. Students should be encouraged to collaborate with faculty members on research projects that have commercial potential, learning to identify market opportunities for scientific discoveries and technological innovations. The integration of scientific research with entrepreneurship education should also include training in intellectual property management, technology transfer processes, and commercialization strategies to ensure students can effectively navigate the complex process of bringing research-based innovations to market.

4 Implementation strategies and support mechanisms

4.1 Faculty development and training programs

The successful implementation of integrated professional and entrepreneurship education requires comprehensive faculty development initiatives. Faculty members must be equipped with both deep agricultural expertise and entrepreneurial knowledge to effectively guide students through integrated learning experiences. Professional development programs should include entrepreneurship education methodologies, industry trends analysis, business planning techniques, and practical experience in agricultural enterprises. Faculty should also participate in sabbatical programs with agricultural businesses and startups to maintain current understanding of industry practices and challenges.

4.2 Industry partnership development

Strategic partnerships with agricultural businesses, technology companies, and government agencies provide essential support for experiential learning opportunities. These partnerships should encompass internship programs, mentorship initiatives, collaborative research projects, and employment placement services. Industry partners can provide real-world problem-solving opportunities, access to current technologies and practices, and potential funding sources for student entrepreneurial ventures. Regular industry advisory board meetings ensure curriculum relevance and alignment with current market demands.

4.3 Assessment and evaluation frameworks

Comprehensive assessment methodologies must be developed to evaluate both professional competency development and entrepreneurial skill acquisition. Assessment should include traditional academic measures, practical project evaluation, entrepreneurial venture development, and long-term career tracking. Portfolio-based assessment approaches allow students to document their learning journey and demonstrate the integration of professional knowledge with entrepreneurial capabilities. Peer evaluation and industry professional assessment provide additional perspectives on student development and achievement.

5 Conclusion

The systematic integration of professional education with innovation and entrepreneurship education represents a transformative approach to agricultural talent development that enhances both professional competencies and entrepreneurial capabilities. This comprehensive integration cultivates high-quality agricultural professionals who demonstrate deep understanding of agricultural principles, genuine commitment to rural development, and innovative problem-solving capabilities, providing substantial support for rural revitalization and agricultural modernization initiatives.

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