

The "Concurrent Cultivation and Training, Quadrilateral Synergy" Development Model of Vocational Education in Boosting Locally Characteristic Industries: A Case Study of Model Application within the Liuzhou River Snail Rice Noodles Industry

Authors

Qing Qin, Huiyu Wu, Chenghao Li, Han Huang

Correspondence

Huiyu Wu, Email: 303311159@qq.com

Received: May 8, 2025

Revised: May 26, 2025

Accepted: June 18, 2025

Published: June 15, 2025

Citation

Qin, Q., Wu, H.Y., Li, C.H., & Huang H. (2025). The "Concurrent Cultivation and Training · Quadrilateral Synergy" Development Model of Vocational Education in Boosting Locally Characteristic Industries: A Case Study of model application within the Liuzhou River Snail Rice Noodles Industry. *Global Cases & Practices of Vocational Education*, 1(1), 49-69.

The "Concurrent Cultivation and Training, Quadrilateral Synergy" Development Model of Vocational Education in Boosting Locally Characteristic Industries: A Case Study of Model Application within the Liuzhou River Snail Rice Noodles Industry

Qing Qin^a, Huiyu Wu^a, Chenghao Li^a, Han Huang^a

^a Liuzhou No.1 Vocational and Technical School

Abstract

This paper looks at Liuzhou River Snail Rice Noodle – an industry with local character – to explore how practical education can support its progress in standardization, production on a large scale and branding through the “Concurrent Cultivation and Training · Quadrilateral Synergy” model. The study finds that vocational education effectively promotes the transformation and upgrading of the River Snail Rice Noodle industry by constructing a curriculum system that aligns with industrial needs, enhancing the innovative and entrepreneurial capabilities of practitioners, formulating industrial standards, and establishing a collaborative industrial chain ecosystem involving government, schools, and enterprises. This provides valuable experience for vocational education in serving the local economy.

Keywords: *Dual-Qualified Teachers, Vocational Education Policies, Teacher Capability Development*

Introduction

In April 2021, during a visit to Guangxi, General Secretary Xi Jinping made an important observation. He said, "Developing industries that are unique to a region is a practical way for local governments to bolster, fortify, and enhance the real economy. We need to make the most of our local conditions and strengths to drive high-quality growth. It's crucial that we stick to high standards of quality and safety, pushing for better standardization and branding. We should also help private businesses tackle the real challenges they face, supporting and guiding them as they grow and expand." This key message didn't just lay out a path for the growth of the Liuzhou River Snail Rice Noodle industry; it also gave us a basic blueprint for how vocational education can support these local, distinctive industries.

In recent years, as local industries with unique characteristics start to flourish, a big question in vocational education reform is how to train top-notch talent through vocational programs that align

with what these industries need to grow. Pairing vocational education with the development of local industries is a key strategy for achieving high-quality economic growth in a region. Wang (2025) has argued that for vocational education to achieve high-quality development, integrating it with industry is a must. By working closely with industries, vocational education can better serve the local economy. Gong (2022) took a look at why Liuzhou River Snail Rice Noodle became such a hit in the new media era, pointing out that branding and going digital were key to its success. Wei and Zhou (2024) examined the current state and challenges of the Liuzhou River Snail Rice Noodle industry in the digital economy, stressing that integrating the supply chain and standardizing operations are essential for the industry's long-term success. Fang Xiaohui (2024) looked into how vocational education can play a role in rural revitalization, emphasizing vocational education's key part in training talent and empowering industries. These studies give us a solid theoretical grounding for exploring how vocational education can fuel the growth of local industries through a model we're calling "Concurrent Cultivation and Training · Quadrilateral Synergy."

Practical Dilemmas in the Development of the River Snail Rice Noodle Industry

Liuzhou is a large industrial and commercial town in the southwest of China, having it one of the deeper culinary traditions with River Snail Rice Noodle being one of the star dishes. Its own flavor profile (fresh, aromatic, sour and spicy) has not only won the hearts of locals but made it across the distance to provincial, national and even international industry, backed by new marketing tools and logistics. In recent years, the River Snail Rice Noodle industry has witnessed explosive growth, driving the coordinated development of the upstream and downstream industrial chains and becoming a new engine for Liuzhou's economic growth. However, concurrently, the industry has encountered numerous obstacles on its path towards high-quality development. An in-depth analysis of these practical dilemmas is of paramount importance for the long-term development of the industry.

Low Degree of Industrial Standardization: The Teething Pains of Transitioning from Traditional Workshops to Modern Industries

Inertia from Historically Inherited Production Models. From 1980s to 1990s, River Snail Rice Noodle is developed when it is sold openly under the skies and beside the streets and alleys in Liuzhou, and ran family-workshop business. This production model, while offering flexibility advantages within the economic context of the time, lacked long-term planning. Over an extended period, the industry developed production habits reliant on the personal experience of chefs, with significant disparities observed among different workshops in terms of ingredient selection, cooking processes, and seasoning ratios. For instance, in the pickling process of sour bamboo shoots, some workshops adopted traditional large-vat pickling methods, relying on natural fermentation without precise control over key parameters such as temperature, humidity, and time. This resulted in considerable fluctuations in the acidity and taste of the sour bamboo shoots. Similarly, in the preparation of river snail soup, chefs added spices based on personal intuition, leading to noticeable differences in the flavor of soup batches. This production model not only poses potential food safety risks but also makes it challenging to rapidly promote the concept of

standardized production due to the inertia of the existing production mode.

Multiple Barriers to the Implementation of Standardization. Some of small production bodies are individual industrial and commercial households with poor investment subject, so that there is no conditions for the introduction of advanced production equipment and testing technology. Even if some enterprises recognize the significance of standardization, they are unable to undertake technological upgrades due to financial constraints. Analyzing from the level of industry standards, although the government and industry associations have formulated a series of standards in recent years, the mechanisms for implementing and supervising these standards remain inadequate. Some enterprises, in an effort to reduce costs, engage in shoddy workmanship and non-compliant production practices, resulting in inconsistent product quality of River Snail Rice Noodles in the market. Furthermore, consumers' traditional perceptions of River Snail Rice Noodles also impede the advancement of standardization. Some consumers believe that only handmade, uniquely flavored River Snail Rice Noodles are authentic, harboring resistance towards industrially produced, standardized items.

Profound Impacts on Industrial Development. The low standardized level affects the River Snail Rice Noodle industry market to some extent. With the fluctuation of product quality, it is hard for consumers to have their loyalty to the brand and word-of- of River Snail Rice Noodles in national or global markets. Simultaneously, it is challenging to meet the demands of large-scale production, leading enterprises to be unable to guarantee timely supply when receiving substantial orders, thus missing out on market opportunities. Additionally, low standardization is not conducive to the standardized management of the industry, increasing the difficulty of food safety supervision. Once quality issues arise, they can easily trigger a crisis of consumer trust in the entire industry.

Fragmented Industry and Low Synergy: "Breakpoints" and "Pain Points" in the Industrial Chain

Independent Operations and Conflicts of Interest Across the Industrial Chain. The River Snail Rice Noodle industrial chain encompasses multiple links, including raw material supply, processing and production, and market sales. However, currently, there is a lack of effective cooperation mechanisms among enterprises at each link, resulting in a state of fragmented and self-governed operations. In the raw material supply link, suppliers of key ingredients such as river snails and sour bamboo shoots are predominantly scattered farmers and small cooperatives. These suppliers are more concerned with their own interests and lack long-term cooperation plans with downstream enterprises. For instance, during the peak supply season of river snails, some suppliers, in pursuit of short-term profits, sell high-quality river snails at premium prices to other buyers, leading to raw material shortages and quality deterioration for River Snail Rice Noodle production enterprises. In the midstream, there are significant disparities in technological levels and production capacities among seasoning and pre-packaging manufacturers. Some small manufacturer cut down the costs through using the prime cost, confuse the quality of River Snail Rice Noodles. The downstream resources of physical stores, supermarkets and e-commerce sales channels form a competitive relationship, lack the market promotion and price coordination mechanism in unity, result in market chaos.

Poor Information Circulation and Difficulties in Resource Integration. There is serious lag and distortion in information diffusion between all types of links in the industrial supply chain.

Upstream suppliers struggle to promptly grasp the production plans and changes in market demand of downstream enterprises, resulting in a mismatch between raw material supply and production needs. Midstream production enterprises lack accurate understanding of market dynamics, leading to untargeted product development and potential inventory backlogs or supply shortages. Downstream sales channels lack an information-sharing platform, making it impossible to achieve real-time feedback and analysis of sales data, which complicates the formulation of precise marketing strategies. Additionally, due to the absence of effective resource integration mechanisms, the resources of enterprises at each link cannot be fully utilized, leading to redundant construction and resource waste.

Chain Reactions of Insufficient Industrial Synergy. The fragmentation of the industry and low synergy result in low production efficiency and increased operational costs for enterprises. In the raw material procurement link, due to the dispersed nature of suppliers, enterprises need to invest substantial human and material resources in procurement negotiations and quality control, thereby increasing procurement costs. In the production link, the lack of collaboration among enterprises prevents the sharing of production equipment and the optimization of production processes, leading to low production efficiency. In the sales link, competition among various sales channels drives up marketing costs and yields ineffective brand promotion. This inefficient and high-cost industrial structure is difficult to sustain the scaled development of the industry and also undermines the competitiveness of the River Snail Rice Noodle industry in the market.

Talent Shortage and Insufficient Innovation Ability: The "Power Weakness" in Industrial Upgrading

Disconnection Between Talent Cultivation System and Industrial Demands. A number of weaknesses have been found in the traditional applied education of Liuzhou specially serving the talents training to the River Snail Rice Noodle industry. The curriculum design of vocational colleges predominantly emphasizes traditional culinary skills training, with limited coverage of knowledge and skills in modern enterprise management, marketing, and e-commerce operations. For instance, in the River Snail Rice Noodle production major, most courses revolve around traditional production techniques, lacking instruction in relevant fields such as food quality and safety, production management, and brand planning. Meanwhile, the collaboration between vocational education and enterprises is not sufficiently close, resulting in a scarcity of practical opportunities for students during their school years. This makes it challenging for them to integrate theoretical knowledge with actual production, leading to a prolonged adaptation period for graduates to fit into their work roles after entering enterprises.

Challenges in Talent Recruitment and Retention. Liuzhou, located in the southwest region, lags behind first-tier cities in terms of economic development, living environment, and scientific research resources, resulting in insufficient attractiveness to high-end talents. Although the River Snail Rice Noodle industry has rapidly developed, it has a low level of output and product added value and the employees' salary and career development chances are not high, so it is hard to include talented individuals with abundant experience and ability to innovate. Moreover, enterprises lack effective incentive mechanisms in talent management and do not place sufficient emphasis on or invest in talent cultivation, leading to a severe brain drain. For instance, some enterprises underinvest in technological research and development (R&D) and brand marketing, leaving employees devoid of innovation impetus and a sense of accomplishment, prompting them

to seek opportunities in other industries or regions.

Constraints of Insufficient Innovation Capacity on Industrial Development. The lack of talent has resulted in a lack of technological innovation, product innovation and marketing innovation. In terms of technological innovation, enterprises lack professional R&D teams and financial support, hindering their ability to conduct research on and application of new technologies and processes. For example, progress in preservation techniques and flavor enhancement of River Snail Rice Noodles has been sluggish, affecting product quality and market competitiveness. In terms of product innovation, most new products launched by enterprises are simple imitations or modifications of traditional offerings, lacking innovation and differentiation, and thus failing to meet the increasingly diverse needs of consumers. In terms of marketing innovation, enterprises rely heavily on a single marketing approach, primarily depending on physical stores and traditional advertising, while underutilizing emerging marketing channels such as e-commerce and social media. This has resulted in slow growth in brand awareness and market share.

Teaching Challenges in the River Snail Rice Noodle Industry from the Perspective of Vocational Education

In recent years, Liuzhou River Snail Rice Noodle industry has developed rapidly due to its distinctive taste and huge market prospects, its industrial scale is expanding and the demand for talents is becoming more specialized. Vocational education is the support mainstay of talents, it is most desirable to be consistent with the industrial demand and offer strong talent support for the River Snail Rice Noodle industry. However, in reality, vocational education has encountered numerous teaching dilemmas when serving the River Snail Rice Noodle industry. These issues not only constrain the development of vocational education itself but also impede the upgrading and innovation of the River Snail Rice Noodle industry. Therefore, it is of great practical significance to conduct an in-depth analysis of the teaching challenges in the River Snail Rice Noodle industry from the perspective of vocational education.

Disconnection Between Teaching Content and Industrial Demands: The Misalignment Between Industrial Characteristics and Educational Offerings.

After years of development, River Snail Rice Noodle has transformed from a traditional local snack to a modern industry covering upstream raw material cultivation and breeding, midstream production and processing, downstream circulation, brand promotion and e-commerce business, and the effect of scale is gradually emerging. However, the traditional vocational education curriculum system is mostly constructed based on general culinary majors, failing to promptly capture the uniqueness and innovation of the River Snail Rice Noodle industry. On the one hand, vocational education lacks in-depth research on the River Snail Rice Noodle industry during the curriculum development process, resulting in insufficient understanding of the actual needs of various industrial links. On the other hand, influenced by traditional educational concepts, it places excessive emphasis on the cultivation of basic culinary skills while neglecting the special requirements of the River Snail Rice Noodle industry in areas such as operation and management, brand building, and food safety.

In terms of curriculum setup, general culinary skill courses occupy a significant proportion, such

knife skills, heat control, and traditional cuisine preparation. In contrast, specialized courses targeting the production techniques of River Snail Rice Noodles, such as the optimization of river snail soup base preparation, the improvement of sour bamboo shoot fermentation technology, and the flavor blending of chili oil, are relatively scarce. In the realm of operation and management, there is a lack of courses on production management, cost control, and supply chain management for River Snail Rice Noodle enterprises, making it difficult for students to be competent in corporate management roles after graduation. In the field of brand marketing, there is minimal coverage of content related to brand positioning, market promotion, and new media marketing for River Snail Rice Noodles. As a result, students are unable to grasp how to utilize modern marketing strategies to enhance the brand awareness and market share of River Snail Rice Noodles.

The disconnection between teaching content and industrial demands leads to a severe mismatch between the knowledge students acquire and the actual work scenarios, making it difficult to meet the needs of enterprises for high-quality technical and skilled talents. Enterprises are compelled to invest substantial time and costs in providing secondary training for newly hired employees, thereby increasing labor costs and operational risks. At the same time, such mismatch also leads to the non-competitiveness of talent trained by vocational education in the labor market, which has certain negative impact on the employment quality and social status of vocational education. As a result, it hinders the deeper integration of vocation education and the River Snail Rice Noodle industry.

Weakness in Practical Teaching: The "Last Mile" Dilemma Between Theory and Practice.

The industry of River Snail Rice Noodle is of extremely high requirement of the practical operational proficiency and production management ability of the technicians. However, vocational education exhibits notable shortcomings in its practical teaching segments. On the one hand, constrained by factors such as funding and space, the equipment within on-campus training bases is updated slowly, and the technological standards lag behind the actual production environments of enterprises. Some schools still utilize outdated River Snail Rice Noodle production equipment, preventing students from accessing cutting-edge technologies and processes within the industry. On the other hand, the construction of off-campus internship bases lacks a long-term cooperation mechanism, and enterprises exhibit low enthusiasm for participating in vocational education, resulting in limited internship opportunities for students and difficulties in ensuring the content and quality of their internships.

The equipment within on-campus training bases is outdated and has limited functionality. Thus fails to simulate the full-scale production scenarios of River Snail Rice Noodle enterprises, from raw material procurement and processing to finished product packaging. For instance, in the practical training of pre-packaged River Snail Rice Noodle production, there is a lack of automated packaging equipment and quality inspection devices, making it difficult for students to master modern production processes and quality control points. Regarding the construction of off-campus internship bases, enterprises often treat interns as cheap labor, assigning them to simple and repetitive tasks such as raw material cleaning and packaging box folding, lacking practical guidance in production management and technological R&D for students. Additionally, the scheduling of internships is unreasonable. Some schools concentrate internships at the end of the semester, with a short duration, preventing students from gaining an in-depth understanding of enterprises' production and operation modes and industry trends.

The drawbacks of practical training links in production processes contribute to a heavy shortage of students' practical working ability and production-management ability. After graduation, the students who want to work in enterprises need a long time to adapt to the production rhythm and management demands of enterprises, which brings higher training cost and management difficulty to enterprises. At the same time, the similar lack of systematic practice teaching also affects the students' understanding and mastering of professional knowledge, and decreases their enthusiasm for learning and professional identity, which is not conducive to the realization of the vocational education objective of talent training.

Lag in Innovation and Entrepreneurship Education, Source of "Power Impotence" in Industrial Innovation and Development.

Against the backdrop of mass entrepreneurship and innovation, the River Snail Rice Noodle industry urgently requires talents with an entrepreneurial spirit and capabilities. However, vocational education, when cultivating talents for the River Snail Rice Noodle industry, generally neglects the cultivation of innovation and entrepreneurship abilities. On the one hand, constrained by traditional educational concepts, schools place excessive emphasis on imparting students with professional knowledge and skills, while overlooking the cultivation of students' innovative thinking, entrepreneurial awareness, and entrepreneurial capabilities. On the other hand, there is a lack of faculty with experience and capabilities in innovation and entrepreneurship education. Teachers themselves lack entrepreneurial practical experience and industry resources, making it difficult for them to effectively carry out innovation and entrepreneurship education.

The curriculum system lacks specialized modules for innovation and entrepreneurship education, with no courses offered on the basics of entrepreneurship, marketing planning, project financing, etc. Consequently, students have limited knowledge of the fundamental theories and methods of innovation and entrepreneurship. Teaching methods are monotonous, predominantly relying on traditional classroom lectures, and lacking interactive teaching approaches such as case analysis, group discussions, and project practices. This makes it challenging to stimulate students' innovative thinking and entrepreneurial enthusiasm. Schools provide inadequate support in terms of innovation and entrepreneurship guidance, project incubation, and resource integration. There is a lack of practical platforms and mentor teams for innovation and entrepreneurship, making it difficult for students with good entrepreneurial ideas to receive effective guidance and support.

The lag in innovation and entrepreneurship education results in talents within the River Snail Rice Noodle industry lacking self-employment awareness and capabilities. After graduation, most of them enter enterprises through traditional employment modes, struggling to become drivers of industrial innovation. This not only constrains the innovative development of the River Snail Rice Noodle industry but also impedes the optimization and upgrading of its industrial structure. Meanwhile, the absence of an innovation and entrepreneurship atmosphere also renders talents cultivated by vocational education less competitive in the job market, making it difficult for them to adapt to the demands of diversified industrial development.

Mismatch Between Industrial Standards and Teaching Standards: The "Linkage Gap" in Talent Cultivation and Industrial Norms.

With the rapid development of the River Snail Rice Noodle industry, the government and

industry associations have formulated a series of stringent standards concerning product quality, production processes, and food safety to ensure the industry's healthy and sustainable development. However, the update of teaching standards in vocational education lags behind, failing to achieve effective alignment with industrial standards in a timely manner. On the one hand, the formulation cycle of teaching standards in vocational education is relatively long, lacking a dynamic tracking and timely adjustment mechanism for changes in industrial standards. On the other hand, there is a lack of effective communication and cooperation between schools and enterprises, resulting in insufficient understanding of the implementation of industrial standards and the actual needs of enterprises, thereby creating a gap between teaching standards and industrial standards.

In terms of curriculum setup, the new standards and norms of the River Snail Rice Noodle industry, such as the national food safety standards for River Snail Rice Noodles and the general principles for pre-packaged food labeling, have not been incorporated into the teaching content. The teaching content is outdated, still adhering to past production processes and technological standards, which are out of sync with the actual production requirements of enterprises. The assessment and evaluation methods are monotonous, primarily relying on theoretical examinations, and lacking assessments of students' practical operational abilities and their mastery of industrial standards. This leads students to focus solely on theoretical knowledge learning while neglecting the cultivation of practical skills and adherence to industrial norms.

The mismatch between industrial standards and teaching standards makes it difficult for students to adapt to enterprises' production norms and quality requirements after graduation, increasing enterprises' training costs and management difficulties. During the recruitment process, enterprises often need to provide additional training for new employees to familiarize them with the enterprise's production processes and quality standards. This not only affects enterprises' production efficiency but also reduces the employment quality and social recognition of vocational education. Meanwhile, this mismatch also impedes the connotative development of vocational education, making it difficult to cultivate high-quality technical and skilled talents that meet the needs of the industry's high-quality development.

Vocational education faces numerous teaching challenges in serving the River Snail Rice Noodle industry, including a disconnection between teaching content and industrial demands, weaknesses in practical teaching segments, a lag in innovation and entrepreneurship education, and a mismatch between industrial standards and teaching standards. These challenges are intertwined and mutually influential, severely constraining the coordinated development of vocational education and the River Snail Rice Noodle industry. To address these challenges, vocational education should strengthen its deep integration with the River Snail Rice Noodle industry, deepen curriculum system reforms, enhance practical teaching segments, strengthen innovation and entrepreneurship education, promote the alignment of teaching standards with industrial standards, and cultivate high-quality technical and skilled talents that meet industrial needs, thereby providing strong talent support for the sustained and healthy development of the River Snail Rice Noodle industry. Meanwhile, the government, enterprises, and schools should strengthen cooperation to jointly create a favorable environment for the coordinated development of industry and education, promoting mutual benefits and win-win outcomes between the River Snail Rice Noodle industry and vocational education.

Key Practices

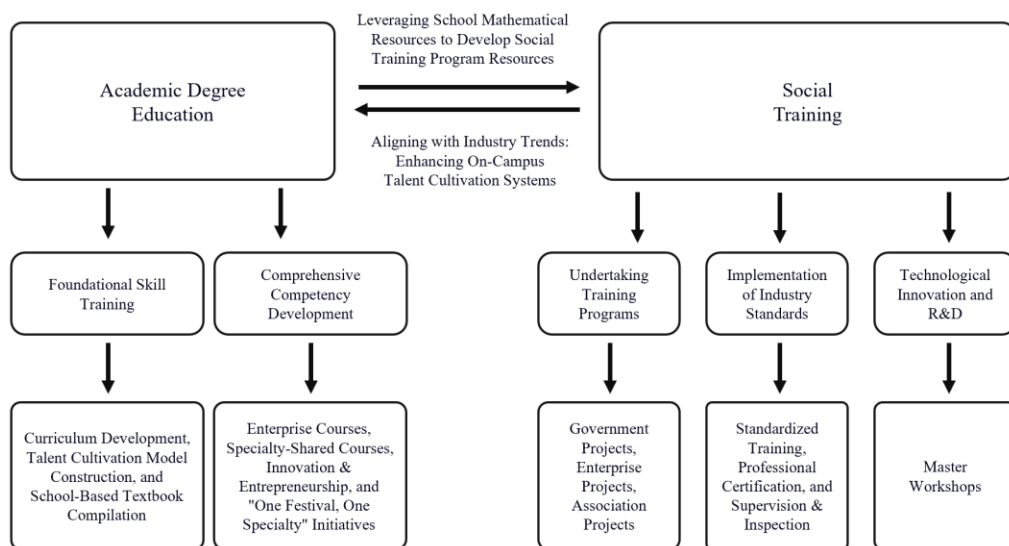
In response to the dilemmas encountered by the River Snail Rice Noodle industry during its process of large-scale, standardized, and innovative development, as well as the teaching challenges posed by the mismatch between talent cultivation in vocational education and industrial demands, Liuzhou No.1 Vocational Technical School has innovatively introduced the "Education and Training Parallel · Four-Way Synergy" model, injecting strong impetus into the high-quality development of the River Snail Rice Noodle industry.

"Concurrent Education and Training": A Dual-Track Cultivation Approach for Precise Alignment with Industrial Demands

Curriculum System, Deep Integration Guided by Industrial Needs: Based on years of accumulated teaching experience, the school has meticulously established a "Concurrent Education and Training" dual-track cultivation model that runs parallel academic education and social training (as illustrated in Figure 1). To achieve seamless alignment between talent cultivation and the River Snail Rice Noodle industry, the school has assembled a professional research team to delve into various links of the River Snail Rice Noodle industrial chain, accurately grasping the dynamics of industrial demands. Based on this, the school has developed specialized core courses with strong local characteristics, such as "River Snail Rice Noodle Production and Store Operation" and "Local Snack Production," and formulated detailed curriculum standards, forming a curriculum system deeply integrated with the industry.

Figure1

Dual-Track Training Model Combining "Education and Training"



In terms of curriculum content design, the school not only delves deeply into the essence of traditional River Snail Rice Noodle production techniques but also incorporates key links of the modern industrial chain. Taking the course "River Snail Rice Noodle Production and Store Operation" as an example, while students systematically learn traditional production processes such as soup base preparation, ingredient pairing, and noodle cooking techniques, they also delve into practical operational knowledge, including the golden rules of store location selection, precise positioning of decoration styles, scientific methods of personnel management, and refined strategies for cost control. This teaching model, which closely integrates theory with practice, enables students to quickly adapt to and meet job requirements after graduation, whether they choose to start their own River Snail Rice Noodle stores through entrepreneurship or engage in relevant work within enterprises.

Practical Teaching, Industry-Education Integration Facilitates the Enhancement of Vocational Competencies. The school actively promotes in-depth integration between industry and education, meticulously designing courses in collaboration with River Snail Rice Noodle production enterprises to create an authentic working environment for students, where they can hone their vocational competencies through practice. Meanwhile, the school introduces shared professional courses in marketing, entrepreneurship, etc., to comprehensively enhance students' overall qualities and entrepreneurial capabilities.

The school has established profound cooperative relationships with renowned enterprises in the industry, such as Luobawang and Liujiang Renjia, jointly creating off-campus internship bases. By interning in the authentic production environments of these enterprises, students can intuitively understand the enterprises' operational modes, market demand dynamics, and industry development trends. During the internship process, students have the opportunity to participate in every link of River Snail Rice Noodle production, from raw material procurement, processing, and manufacturing to finished product packaging, experiencing firsthand every detail of the production process and accumulating invaluable practical work experience. Additionally, technical backbone personnel from these enterprises regularly deliver lectures and conduct skill training sessions at the school, imparting the latest industry technologies and practical experiences to students.

Social Training, Inclusive Services Enhance the Quality of Industrial Talents. Adhering to the educational philosophy that "everyone can achieve success," the school is committed to enhancing the inclusiveness of public services in vocational education. As a demonstration base for the River Snail Rice Noodles (River Snail Rice Noodle) labor brand recognized by the Regional Human Resources and Social Security Department, the school fully leverages its advantages to conduct multi-level and comprehensive specialized training for practitioners in the River Snail Rice Noodles industry, continuously strengthening its professional social service functions.

Based on the dynamic changes in talent demands within the River Snail Rice Noodles industry, the school continuously refines its curriculum system. The annual specialized training sessions on River Snail Rice Noodles production attract a large number of participants from across the country. The training content is rich and comprehensive, encompassing the essence of traditional River Snail Rice Noodles production techniques, innovative applications of modern production technologies, stringent quality control standards, and key aspects of food safety. Through systematic training, participants not only master the core skills of River Snail Rice Noodles production but also gain insights into the latest industry trends and developments. Upon completion of the training, participants can obtain corresponding vocational skill level certificates, which undoubtedly adds

significant weight to their employability in the job market and significantly enhances their competitive edge.

Promoting Industrial Standardization and Scalability, Leading Industrial Upgrading

School Takes the Lead, Exploring Pathways for Scalable and High-End Development. The school's training base enterprise, Yizhi Grand Hotel in Liuzhou, is one of the early pioneers in the large-scale operation of River Snail Rice Noodles (River Snail Rice Noodle) in Liuzhou, providing valuable experience for the development of the River Snail Rice Noodles industry. In 2016, the school, with a keen eye for market opportunities, took the lead in attempting the production and sales of bagged River Snail Rice Noodles, opening a new chapter in the industrialized production of the River Snail Rice Noodles industry. In 2021, the school further intensified its innovation efforts by establishing the River Snail Rice Noodles Collaborative Education Center, an industry-education integration base, to fully drive the development of River Snail Rice Noodles products towards a high-end trajectory.

At the Collaborative Education Center, the school has gathered a group of industry experts and technical backbone personnel to conduct innovative research on River Snail Rice Noodles production techniques. Through continuous optimization of raw material selection, improvement of production processes, and development of new seasoning formulas, the center has successfully enhanced the quality and taste of River Snail Rice Noodles products. For instance, in the aspect of soup base preparation, the research team, after repeated trials, has adopted a variety of high-quality ingredients and unique brewing methods, resulting in a more rich, mellow, and lingering soup base. In terms of ingredient pairing, new ingredients and techniques have been introduced, enriching the variety and taste of the ingredients to meet the needs of different consumers. These innovative achievements not only promote the high-end development of the River Snail Rice Noodles industry but also provide abundant practical cases for the school's teaching and scientific research.

Fostering Entrepreneurship, Cultivating Industry-Leading Enterprises. The school actively encourages outstanding graduates to engage in innovation and entrepreneurship within the River Snail Rice Noodles (River Snail Rice Noodle) industry, providing them with comprehensive support and assistance. With the school's help, numerous outstanding graduates have successfully established leading enterprises in the industry, such as Luobawang, Liujiang Renjia, and Hugui Group, becoming the mainstay driving the development of the River Snail Rice Noodles industry. Taking Luobawang as an example, its founder is an outstanding graduate of the school's culinary arts program. During his time at the school, he not only mastered solid culinary skills but also cultivated a keen market insight and innovative spirit. After graduation, he led his team to conduct in-depth market research, combining traditional production techniques with modern consumption concepts to develop a series of innovative River Snail Rice Noodles products. Through vigorous promotion on e-commerce platforms, Luobawang River Snail Rice Noodles quickly expanded into the national market, becoming a well-known brand familiar to consumers. Meanwhile, the school has established close cooperative relationships with these enterprises, jointly creating internship bases and employment channels, thus providing students with abundant practical opportunities and broad employment prospects. During their internships at these enterprises, students can gain exposure to the cutting-edge industry technologies and advanced production management modes, laying a solid foundation for their future career development.

Standard Setting, Ensuring Industrial Quality and Efficiency. For the sustainable

development of the Liuzhou River Snail Rice Noodles (River Snail Rice Noodle) industry, adherence to high standards is imperative. Building upon the in-house curriculum standards for River Snail Rice Noodles production, the school leverages its professional expertise to spearhead the formulation of two local food safety standards for the Guangxi Zhuang Autonomous Region and twelve local standards for Liuzhou City, all pertaining to River Snail Rice Noodles.

These industrial standards meticulously and rigorously stipulate key aspects of River Snail Rice Noodles production, including craftsmanship, raw material selection, and quality control. In terms of craftsmanship, specific parameters such as the duration, temperature, and ingredient ratios for soup base preparation are clearly defined to ensure consistent quality and taste in every bowl of River Snail Rice Noodles. Regarding raw material selection, regulations specify the origin, quality standards, and inspection methods for ingredients like pickled bamboo shoots, wood ear mushrooms, and peanuts, safeguarding product safety and quality from the source. In quality control, a comprehensive quality inspection system and traceability mechanism are established to rigorously test each batch of products, ensuring compliance with standard requirements. Through the formulation and implementation of these standards, the production efficiency and product quality of the River Snail Rice Noodles industry have significantly improved, providing robust support for its large-scale and standardized development. In 2022, the standard system for the entire River Snail Rice Noodles industrial chain in Liuzhou was basically formed, marking a new phase of standardized and high-quality development for the River Snail Rice Noodles industry.

Constructing a "Quadrilateral Synergy" Ecosystem of Government, University, Enterprise, and Association to Optimize Industrial Resource Allocation

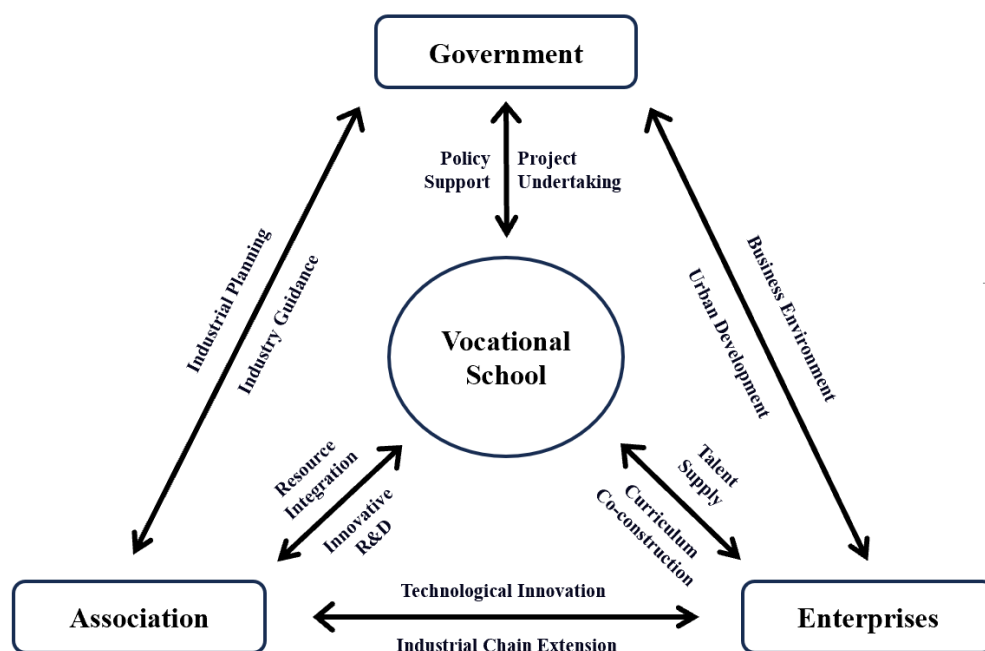
Mutual collaboration among diverse entities is pivotal for achieving resource interoperability, sharing, and complementary advantages. Leveraging its abundant social resources, the university actively engages in industry development, proactively liaises with governmental departments, industry associations, and enterprises, and establishes a resource integration platform, thereby forming an industrial chain ecosystem characterized by "quadrilateral synergy" (as illustrated in Figure 2).

Government Synergy, Policy Guidance and Financial Support. At the governmental level, the university closely adheres to relevant policy guidelines, actively responds to Liuzhou's "Five Ones" initiative for the River Snail Rice Noodles (River Snail Rice Noodle) industry, and proactively undertakes industry-related training projects. Through close collaboration with governmental departments such as the Bureau of Commerce and the Bureau of Human Resources and Social Security, the university has established a "River Snail Rice Noodles Industry Service Task Force," coordinating over 50 million yuan in policy support funds. These funds are primarily used to support technological upgrades, brand building, and talent cultivation within enterprises, effectively facilitating 50 enterprises in obtaining ISO certification and enhancing their management capabilities and market competitiveness. Simultaneously, the government has introduced a series of preferential policies to encourage enterprises to engage in industry-university-research cooperation with the university, fostering a favorable policy environment for the development of the River Snail Rice Noodles industry.

University Synergy, Talent Cultivation and Supply. The university fully leverages its core role in talent cultivation, continuously conducting River Snail Rice Noodles-related social training through a dual-track cultivation model of "concurrent education and training." In terms of academic

Figure 2

A Schematic Diagram of the Industrial Chain Ecosystem Based on "Quadrilateral Synergy"



education, the university meticulously develops boutique courses in local snack production and River Snail Rice Noodles production, emphasizing the integration of theory and practice to cultivate students' professional skills and innovative capabilities. Through these initiatives, the university continuously supplies the industry with standardized professionals of different levels and attributes, constructing a comprehensive talent matrix for the industry and providing solid talent support for the development of the River Snail Rice Noodles industry.

Enterprise Synergy, Innovation, Entrepreneurship, and Talent Cultivation. At the enterprise level, the university continuously nurtures and supports outstanding graduates in launching innovation and entrepreneurship activities, assisting them in establishing high-quality enterprises such as "Luobawang," "Liujiang Renjia," and "Hugui Group." Simultaneously, the university engages in in-depth cooperation with leading enterprises in the industry to jointly create the "River Snail Rice Noodles Collaborative Education Center." Here, enterprises introduce actual production projects into teaching, and university faculty members and enterprise technical backbone personnel jointly guide students in learning and practice, achieving seamless integration between teaching scenarios and production workshops. Through participation in the talent cultivation process, enterprises can obtain high-quality technical and skilled talents that meet their specific needs; the university, leveraging enterprise resources and platforms, can stay abreast of the

latest industry trends and technological developments, continuously optimizing teaching content and methodologies, and realizing a virtuous cycle of development between enterprises and the university.

Association Synergy, Industrial Integration and Innovative R&D. At the association level, the university actively promotes outstanding graduates and industry practitioners to establish or join non-governmental associations, leveraging the resource advantages of associations such as the Liuzhou Culinary and Catering Association and the Liuzhou Gourmet Alliance to integrate upstream and downstream industrial resources, including raw material production bases, bagged River Snail Rice Noodles processing plants, and e-commerce platforms, forming an integrated closed-loop from "cultivation-processing-sales." This full-industry-chain integration model effectively reduces enterprise operating costs, improves operational efficiency, and enhances the overall competitiveness of the industry.

Meanwhile, the university vigorously conducts innovative R&D work relying on the Li Wensen Master Studio. The studio gathers a group of top industry experts and technical talents to tackle technological challenges such as River Snail Rice Noodles preservation and taste consistency. Through unremitting efforts, it has successfully applied for 5 patents, with a technology transfer rate of 80%. These innovative achievements not only resolve technological bottlenecks in the development of the River Snail Rice Noodles industry but also provide strong technological support for its sustained innovation and development.

Liuzhou No.1 Vocational Technical School has achieved remarkable results in talent cultivation, industrial upgrading, and resource integration through the "Concurrent Education and Training · Quadrilateral Synergy" model, setting an exemplary benchmark for the development of the River Snail Rice Noodles industry. In the future, the school will continue to deepen reform and innovation, continuously optimize its talent cultivation model, strengthen cooperation and exchanges with all parties, and contribute more significantly to the high-quality development of the River Snail Rice Noodles industry.

Achievements and Inspirations

Comprehensive Improvement in Talent Cultivation Quality

Precision Delivery of High-Quality Talents to Local Catering Enterprises. The employment quality of graduates serves as a crucial indicator for measuring the match between talent supply and demand. The graduates of the culinary arts program at this school have achieved remarkable employment results, with a primary employment rate consistently maintained above 90% for fifteen consecutive years and an employment satisfaction rate exceeding 95%. Numerous graduates have smoothly entered local catering enterprises, with employment units extensively covering leading enterprises in the River Snail Rice Noodles (River Snail Rice Noodle) industry such as Guangxi Shanyuan Food Co., Ltd. and Guangxi Hugui Food Group. During this process, the school has not only cultivated a large number of industry elites but also produced two inheritors of the intangible cultural heritage of Liuzhou River Snail Rice Noodles, Wu Mengxue and Yang Zhi. Nearly 60% of the executive chefs and backbone employees in the local catering industry and major star hotels are graduates of this school. Relying on the professional knowledge and skills systematically learned during their time at the school, students have rapidly grown into the core forces driving enterprise development, contributing significantly to the sustained growth of enterprises.

Graduates Becoming Core Leaders in the Development of the River Snail Rice Noodles Industry. Outstanding graduates of the culinary arts program at this school have played a pivotal leading role in the development process of the Liuzhou River Snail Rice Noodles industry. They have not only founded and promoted the exquisite development of River Snail Rice Noodles cuisine but also actively participated in the establishment of projects such as the River Snail Rice Noodles Cultural Museum and Guangxi Weizhifang Food Technology Co., Ltd. The founders of the first batch of industrialized River Snail Rice Noodles enterprises and leading enterprises, including renowned companies such as Guangxi Luobawang Food Co., Ltd., Guangxi Shanyuan Food Co., Ltd., and Guangxi Hugui Food Group, as well as representatives in River Snail Rice Noodles industrial technology research and development and inheritors of the intangible cultural heritage of Liuzhou River Snail Rice Noodles, all hail from the culinary arts program at this school. These distinguished graduates have become industry leaders, making indelible and significant contributions to the standardized and large-scale development of the River Snail Rice Noodles industry.

Students Demonstrating Excellent Professional Skills. Since 1999, teachers and students from this school have repeatedly achieved outstanding results in provincial and municipal competitions related to River Snail Rice Noodles, as well as in various competitions organized by industry associations. Among these, they have won 5 first prizes, 2 second prizes, and 2 third prizes at the regional level, with a competition award-winning rate of 100%. From 2010 to 2024, teachers and students from this school participated in national and regional culinary competitions, winning a total of 9 national awards, 61 first prizes at the regional level, 116 second prizes, and 104 third prizes. The school's repeated excellent performances in various competitions fully demonstrate students' solid professional skills, outstanding innovative capabilities, and comprehensive overall qualities.

Promoting the Synergistic Development of Industrial Standardization and Scalability

Notable Achievements in Formulating and Promoting Industrial Standards. The "River Snail Rice Noodles Production Industry Standard" and "Industrialized Food Production Quality Standard" led and formulated by the school have successfully obtained certification as local food safety standards in Guangxi (DBS45 - 034 - 2016). Meanwhile, the school has also formulated 12 local standards for Liuzhou City, which cover 80% of the production enterprises. Through the effective implementation of these standards, the product qualification rate has significantly increased from 65% before the implementation of the standards to 98%. The formulation and promotion of these standards have provided a solid institutional guarantee for the standardized development of the River Snail Rice Noodles industry, effectively enhancing product quality and market competitiveness. Taking the promotion of standards as an example, River Snail Rice Noodles enterprises strictly adhere to quality control standards during the production process, ensuring the stability of product quality and the consistency of taste, thereby enhancing consumer recognition and loyalty to the River Snail Rice Noodles brand.

Remarkable Outcomes in Industrial Resource Integration and Synergistic Development. By actively promoting the deep integration of upstream and downstream resources in the River Snail Rice Noodles industry, the school has facilitated the establishment of the River Snail Rice Noodles Industry Association and the River Snail Rice Noodles Industrial Park, significantly improving the production and operational efficiency of upstream and downstream enterprises and

vigorously driving the rapid and scalable development of the industry. Taking the River Snail Rice Noodles Industrial Park as an example, its establishment has achieved effective coordination in raw material supply, production and processing, sales, and other links, reducing production costs for enterprises and improving production efficiency. Meanwhile, under the organization and coordination of the industry association, enterprises have strengthened cooperation and exchanges, forming a powerful industrial cluster effect and further promoting the scalable development of the River Snail Rice Noodles industry.

A Leap Forward in the Brand Influence of River Snail Rice Noodles

Synergistic Drive of Brand Certification and Talent Cultivation for Brand Development. The school has actively carried out professional certification work for "River Snail Rice Noodles Production Technicians," effectively promoting the implementation of industrial standards and laying a solid foundation for the standardized development of the River Snail Rice Noodles industry. Simultaneously, through extensive social training initiatives, the school has cultivated a large number of high-quality technical and skilled talents for the River Snail Rice Noodles industry, significantly enhancing its brand effects. For instance, the school conducts an average of 5,500 social training sessions annually, covering key positions such as raw material processing, production management, and e-commerce operations, and issues River Snail Rice Noodles-specific skill certifications to trainees. The employment rate of certified individuals reaches as high as 100%. Through standardized training, the skill compliance rate of enterprise employees has increased to 90%, production loss rates have decreased by 20%, and labor costs have been reduced by 30%. These achievements provide a solid talent base for industrial upgrading and further enhance the brand influence of the River Snail Rice Noodles industry.

Complementary Integration of Cultural Tourism and Brand Promotion. Collaborating with industry enterprises and alumni-run businesses, the school has meticulously developed cultural and tourism integration projects such as River Snail Rice Noodles cultural experience study tours and intangible cultural heritage workshops. Taking the promotion of the "River Snail Rice Noodles Cultural Experience Tour" route as an example, tourists not only get to taste authentic Liuzhou River Snail Rice Noodles but also gain an in-depth understanding of its production techniques and cultural connotations, effectively elevating the brand's visibility and reputation. This project annually attracts 100,000 visits from primary and secondary school students as well as tourists, strongly propelling River Snail Rice Noodles culture to become a significant hallmark of Liuzhou as an "internet-famous city" and further expanding the brand influence of River Snail Rice Noodles.

Reflection and Summary

Project Reflection

Inadequate Adaptation of Teaching to Industrial Dynamics. Despite the project's establishment of a curriculum system closely integrated with the industry, the River Snail Rice Noodles industry is in a phase of rapid development, with new technologies and demands constantly emerging. During the project implementation, the updating of teaching content has failed to fully keep pace with the rhythm of industrial changes. For instance, in emerging fields such as e-commerce operations and new media marketing, there is a disconnect between some teaching content and current practical operations, resulting in poor application of students' learned

knowledge in real-world work scenarios. This reflects the need to improve the dynamic adjustment mechanism for curriculum development and establish more efficient channels for industrial information feedback to promptly incorporate the latest industrial trends into teaching.

Limited Depth and Breadth of Practical Teaching. Although the project has strengthened practical teaching links and established internship bases in collaboration with multiple enterprises, there is still room for improvement in the depth and breadth of practical teaching. Due to their own busy production tasks, some enterprises invest limited effort in guiding student internships, making it difficult for students to access core technologies and key production processes. Meanwhile, the practical teaching content mainly focuses on River Snail Rice Noodles production and manufacturing processes, with insufficient practical exploration of other links in the upstream and downstream industrial chain, such as raw material cultivation and breeding, and logistics and distribution. This limits students' opportunities to comprehensively understand the industry and is not conducive to cultivating interdisciplinary talents.

Difficulties in Transforming Innovation and Entrepreneurship Education Outcomes. The project attaches importance to innovation and entrepreneurship education, and some promising entrepreneurial ideas and projects have emerged. However, challenges are faced in transforming these outcomes. On the one hand, students lack resources such as startup capital and market channels, making it difficult to convert their ideas into actual products or services. On the other hand, the school's support and services in terms of entrepreneurial project incubation and market docking are not yet well-developed, leading to the premature demise of some excellent entrepreneurial projects. This indicates that innovation and entrepreneurship education require a more complete ecosystem for support, with enhanced cooperation with financial institutions, enterprises, etc., to provide students with more resources and guarantees for entrepreneurship.

Challenges in Promoting and Supervising the Implementation of Industrial Standards. The school has taken the lead in formulating multiple standards for the River Snail Rice Noodles industry, playing a regulatory role in its development. However, some resistance has been encountered during the standard promotion and implementation supervision process. Some small enterprises and individual industrial and commercial households lack a deep understanding of the standards and show low enthusiasm for implementation, engaging in practices such as cutting corners and illegal production. Meanwhile, the strength for standard implementation supervision is limited, making it difficult to conduct comprehensive and timely supervision of all enterprises. As a result, some non-compliant products still exist in the market, affecting the overall image of the industry and impeding quality improvement.

Uneven Participation of "Quadrilateral Synergy" Entities: In the "quadrilateral synergy" ecosystem involving government, enterprise, school, and association, there is an imbalance in the participation of various parties. The government has played a significant role in policy support and capital investment, but the implementation cycle of some policies is relatively long, affecting the efficiency of project promotion. Enterprises show high enthusiasm in talent cultivation and industrial innovation, but some participate in cooperation more out of their own short-term interests, lacking long-term strategic planning. Industry associations serve as a bridge in resource integration and standard formulation, but their efforts in promoting standard implementation and industry self-regulation need to be strengthened. As the main body of project implementation, the school bears significant pressure in coordinating resources and promoting cooperation among various parties, sometimes finding it difficult to fully meet the needs of all stakeholders.

Project Summary

Remarkable Achievements in Talent Cultivation, Providing Robust Support for the Industry. Through the "Dual Approach of Education and Training with Quadrilateral Synergy" model, the project has achieved notable success in talent cultivation. The curriculum system closely integrated with the industry has equipped students with knowledge and skills in River Snail Rice Noodles production and relevant links of the industrial chain. Strengthening practical teaching links has enabled students to enhance their vocational abilities in real-world work environments. Conducting specialized social training programs for River Snail Rice Noodles has improved the quality of industry practitioners. Graduates enjoy high employment quality, supplying a large number of high-quality talents to local catering enterprises. Many graduates have become industry leaders, steering the development of the River Snail Rice Noodles industry. With outstanding professional skills, students have excelled in various competitions, providing a solid talent guarantee for industrial advancement.

Promoting Standardized and Scalable Industrial Development, Enhancing Industrial Competitiveness. The project has played a pivotal role in driving the standardized and scalable development of the River Snail Rice Noodles industry. The industrial standards formulated under the school's leadership, upon promotion and implementation, have significantly increased product qualification rates, ensuring the quality and taste consistency of River Snail Rice Noodles products, and elevating the industry's overall image and market competitiveness. By facilitating the integration of upstream and downstream resources and aiding in the establishment of the River Snail Rice Noodles Industry Association and industrial parks, the project has improved enterprise production and operational efficiency, propelling the rapid and scalable development of the industry, forming an industrial cluster effect, and enhancing the industry's risk-resilience in the market.

Boosting the Brand Influence of River Snail Rice Noodles, Contributing to Local Economic Development. Through initiatives such as brand certification and talent cultivation, as well as the integration of cultural tourism and brand promotion, the project has significantly enhanced the brand influence of River Snail Rice Noodles. Conducting professional certification for "River Snail Rice Noodles Production Technicians" and promoting standard implementation have improved the quality of industrial talents and the brand effect. The cultural tourism integration projects developed in collaboration with industry enterprises and alumni, such as River Snail Rice Noodles cultural experience study tours and intangible cultural heritage workshops, have attracted a large number of tourists, with an impressive annual visitor count. These projects have propelled River Snail Rice Noodles culture to become a significant hallmark of Liuzhou as an "internet-famous city," driving the development of local tourism, catering, and other related industries, and making important contributions to local economic development.

Exploring New Models for Vocational Education to Serve Local Characteristic Industries, with Demonstrative and Promotional Value. Liuzhou No.1 Vocational Technical School has provided valuable experience for vocational education to serve local characteristic industries through the "Dual Approach of Education and Training with Quadrilateral Synergy" model. This model closely aligns with the needs of local characteristic industries, integrating resources from the government, school, enterprise, and association to achieve a deep integration of talent cultivation and industrial development. This innovative model is not only applicable to the River Snail Rice Noodles industry but also offers references and insights for vocational education in other regions to

serve local characteristic industries. It holds broad demonstrative and promotional value, aiding in the coordinated development of vocational education and the local economy.

Declaration of competing interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Reference

- Cui, S. Q. (2025). An exploration of the development trajectory and value orientation of vocational education from the perspective of the "three attributes" of education. *China Vocational and Technical Education*, (07), 69-75+112.
- Fang, X. H. (2024). A study on the promotion paths of vocational education serving the rural revitalization strategy. *Journal of Liaoning Provincial College of Communications*, 26(03), 43-46.
- Gong, M. Y. (2022). An analysis of the "going viral" strategies and development approaches of Liuzhou River Snail Rice Noodles in the new media era. *Journal of News Research*, 13(12), 181-183.
- Guangxi: The "Liuzhou River Snail Rice Noodles (Revised)" is officially released, and the standard system for the entire industrial chain is basically established. (2022). *China Food*, (22), 22-23.
- Rao, L. X., Xu, Y. F., & Zhang, X. (2022). A brief analysis of the sustainable development status of regional characteristic agricultural product industries: Taking the River Snail Rice Noodles industry in Guangxi as an example. *Shanxi Agricultural Economics*, (10), 92-94.
- Su, G. L. (2019). River Snail Rice Noodles in the wave of "standardization". *Friend of Farmers*, (04), 21.
- Wang, R. R., Zhang, K., & Zhou, J. (2025). A study on the talent supply-demand match in higher vocational education based on national big data analysis. *Journal of Vocational and Technical Education*, 46(12), 67-73.
- Wang, Y. F. (2025). The theoretical implications and practical approaches of industry-education integration in vocational education under the background of high-quality development. *Journal of Vocational and Technical Education*, 46(10), 52-58.
- Wang, Y. L., Qian, X. S., & Zhu, J. W. (2025). The contemporary value, practical issues, and countermeasures of empowering talent cultivation in vocational education through city-level industry-education consortia. *Education and Vocation*, (08), 37-44.
- Zhang, Z. P. (2022). The connotation evolution, ideal pursuit, actual state, and path selection of industry-education integration in the 2.0 era of vocational education. *Adult Education*, (3), 66-73.

Authors' Bibliography

Qing Qin serves as the Head of the Culinary Arts Department at Liuzhou No.1 Vocational and Technical School. She holds the titles of Senior Lecturer and Senior Technician in Catering

Services. She has led multiple projects that have been awarded Provincial-Level Teaching Achievement Prizes and served as the chief editor for a course recognized as a National-Level Online Exemplary Course. Her primary research interests include educational tourism for primary and secondary school students, as well as vocational education in the catering and hospitality sector.

Huiyu Wu is currently employed at Liuzhou No.1 Vocational and Technical School, serving as a Lecturer. She holds a Master's Degree conferred by Pathumthani University in Thailand. Her primary research interests lie in specialty construction and curriculum development within vocational education, with a specific focus on Western-style pastry education.

Chenghao Li is currently employed at Liuzhou No.1 Vocational and Technical School as a full-time faculty member specializing in Western Culinary Arts. He graduated from Xingjian College of Science and Liberal Arts, Guangxi University, holding a Bachelor of Science degree. His primary research interests focus on specialty curriculum construction and development in vocational education, with a specific emphasis on Western culinary arts programs and curriculum design for Southeast Asian cuisine preparation.

Han Huang is currently employed at Liuzhou No.1 Vocational and Technical School as a full-time faculty member. She holds a Master's Degree conferred by Guangxi Normal University. Her primary research area is tourism services in vocational and technical education.