Innovative Research on Collaborative Education Mechanisms Between Second and First Classrooms: Study of Culinary and Food Science Students

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Abstract: Against the backdrop of higher education reform in the new era, effectively integrating professional instruction in the formal classroom with practical activities in the informal classroom to achieve collaborative education has become a critical issue for enhancing the quality of talent cultivation in higher education. Taking culinary and food science students as a case study, this paper analyzes the disconnect between formal and informal education from the dual perspectives of part-time counselors and full-time faculty. It explores the construction of an innovative collaborative education mechanism characterized by "three-dimensional linkage and four-dimensional integration." Through deep integration across four dimensions—curriculum content, faculty resources, evaluation systems, and management platforms—the mechanism aims to organically combine theoretical instruction with practical application, offering a replicable collaborative education pathway for applied undergraduate institutions.

***Keywords*:** Collaborative education; First classroom; Second classroom; Mechanism innovation; Culinary and food studies

1. Introduction

Against the backdrop of higher education's intrinsic development, innovation in talent cultivation models has become central to enhancing educational quality. [1] The first classroom, as the primary arena for traditional professional education, bears the mission of systematically imparting specialized theoretical knowledge. The second classroom, serving as a vital platform for student practical activities, fulfills functions of knowledge application, skill development, and character cultivation. [2] While these two domains should complement and reinforce each other, a disconnect persists in practice: formal classroom instruction often prioritizes theoretical transmission over practical application, while extracurricular activities frequently lack professional depth and become superficial. This fragmentation severely hampers the cultivation of high-caliber applied talents. [3]

As a quintessential applied discipline, culinary arts and food science demands both a solid theoretical foundation and mastery of practical skills and innovative application capabilities. Consequently, the need for synergistic education between formal and informal learning is particularly urgent in this field. [4-6] Drawing from the author's dual perspective as both a full-time faculty member and part-time counselor in culinary arts and food science, this paper explores innovative mechanisms for integrating formal and informal education within this discipline, grounded in practical experience. The aim is to establish a new educational model that deeply integrates theory and practice while mutually reinforcing professional education and quality development, providing practical references for professional education reform in applied undergraduate institutions.

2. Theoretical Foundations and Current Status of Collaborative Education Between Formal and Informal Learning

2.1 Theoretical Foundations of Collaborative Education

Collaborative education theory originates from the synergy theory within systems science, emphasizing coordination, cooperation, and synchronization among different subsystems to achieve a synergistic effect where the whole is greater than the sum of its parts. In education, collaborative education refers to integrating on-campus and off-campus educational resources to build a talent development system involving multiple stakeholders and interactive elements. As two core subsystems within this framework, the formal classroom and extracurricular activities possess inherent complementarity: the formal classroom delivers systematic, structured professional knowledge, while extracurricular activities provide open, comprehensive practical application scenarios. Through effective synergy, they achieve the organic integration of knowledge transmission, competency development, and value formation, promoting students' holistic growth. [7]

2.2 Analysis of Current Education Practices in Culinary and Food Programs

Current first-classroom instruction in culinary and food programs tends to emphasize classical theories and traditional techniques, while failing to adequately connect with the rapidly evolving technologies, processes, and trends in the catering industry. Extracurricular activities, such as skill competitions and club events, often lack systematic theoretical guidance and professional depth, failing to effectively extend academic learning. [8-9] Consequently, a disconnect exists in instructional content between formal and informal learning environments.

Full-time faculty primarily oversee formal classroom instruction but frequently lack exposure to cutting-edge industry practices. Meanwhile, counselors and extracurricular instructors focus more on student management and event organization, often possessing limited understanding of the discipline's professional essence. The absence of effective communication and collaboration mechanisms between these groups hinders the formation of a cohesive educational force. Teaching resources remain fragmented, making it difficult to achieve unified synergy.

In higher education, formal classroom evaluation primarily relies on exam scores, emphasizing knowledge acquisition. [10-11] Extracurricular evaluation, however, often uses quantitative metrics like participation rates and awards, lacking qualitative assessments of students' integrated development in comprehensive qualities and professional competencies. [12] These two evaluation systems operate independently, failing to comprehensively reflect students' actual growth.

First-classroom resources like teaching labs and training bases, and second-classroom resources such as club activity spaces and innovation/entrepreneurship platforms, fall under separate management systems. The absence of integrated planning and sharing mechanisms leads to inefficient resource utilization. This isolation of resource platforms also hinders the implementation of collaborative education mechanisms.

These issues create a disconnect between knowledge and practice in culinary and food science education. Students may master theoretical knowledge but struggle to apply it flexibly in practice. Despite active participation in various activities, they often fail to deepen their professional understanding. Establishing an effective collaborative education mechanism has become essential to overcome this challenge.

3. Establish a collaborative education mechanism for culinary and food science programs featuring “three-dimensional linkage and four-dimensional integration”

Based on collaborative theory and the characteristics of culinary and food programs, this paper proposes an innovative collaborative education mechanism featuring “three-dimensional linkage and four-dimensional integration.” [13] “Three-dimensional linkage” refers to the coordinated interaction among the goal dimension, subject dimension, and process dimension. “Four-dimensional integration” denotes the deep integration of four specific dimensions: curriculum content, faculty team, evaluation system, and management platform.

3.1 Three-Dimensional Synergy: Establishing the Holistic Framework for Collaborative Education

(1) Synergy in the Goal Dimension: Establish a tripartite collaborative education goal system integrating “knowledge-ability-quality.” The primary classroom teaching objectives shift from solely knowledge transmission to equally emphasizing knowledge comprehension and application capabilities. The secondary classroom activity objectives transition from basic skill training to enhancing comprehensive literacy and innovation abilities. Both dimensions form an organic connection under the overarching talent cultivation goal, jointly supporting students' all-round development.

(2) Stakeholder Dimension Synergy: Establish a multi-stakeholder collaborative mechanism involving “full-time faculty – counselors – industry mentors – students.” Full-time faculty provide theoretical guidance and specialized knowledge deepening; counselors organize activities and facilitate character development; industry mentors offer practical guidance and cutting-edge insights; students actively participate in designing and implementing collaborative education activities, forming a two-way interactive, multi-directional educational community.

(3) Process Dimension Integration: Achieve full-process synergy across “curriculum instruction-practical activities-outcome transformation.” Embed second-classroom activities into professional teaching processes to form a spiral-upward cultivation pathway of “theoretical learning-practical validation-innovative application.” For example, introducing innovative product design projects into the “Food Technology” course allows students to apply classroom knowledge to R&D practices in the second classroom, with outstanding outcomes potentially converted into course case studies or entrepreneurial projects.

3.2 Four-Dimensional Integration: Innovative Collaborative Education Implementation Pathways

(1) Curriculum Content Integration: Develop integrated course modules combining “core professional courses + second classroom projects.” Design a series of progressive second classroom project clusters aligned with core competency requirements for culinary and food programs, complementing first classroom theoretical instruction in content and sequencing.

(a) Foundational Skills Module: Integrate courses like “Fundamentals of Cooking Training” with activities such as the “Campus Food Culture Festival” to reinforce basic skills through practice.

(b) Comprehensive Application Module: Combine courses including “Foodservice Management” and “Food Safety” with activities like “Campus Restaurant Operational Practice” and “Food Safety Awareness Week” to enhance applied competencies.

(c) Innovation and R&D Module: Integrates courses like “Art of cooking” and “Culinary Arts” with activities such as “Culinary Creativity Competitions” and “Food Innovation Workshops” to cultivate innovative thinking and R&D capabilities.

(d) Professionalism Module: Integrates courses like “Chinese Culinary Culture” and “Food Service Etiquette” with activities such as “Industry Master Workshops” and “Professional Image Design Competitions” to shape professional ethics and industry identity.

(2) Faculty Integration: Establish a collaborative “dual-instructor, dual-mentor” education team. Implement regular joint teaching research sessions between full-time instructors and counselors to co-design collaborative education plans. Execute a “Teacher-Counselor Pairing Program” to enhance subject teachers' understanding of student development needs while improving counselors' professional guidance capabilities. Additionally, appoint industry experts as extracurricular mentors to create a combined guidance network spanning campus and off-campus, formal and informal settings. Furthermore, establish incentives for faculty participation in extracurricular activities, integrating their mentoring contributions into performance evaluations and professional title assessments.

(3) Evaluation System Integration: Creating a three-dimensional assessment framework combining process-oriented, developmental, and comprehensive evaluation. Break through traditional classroom assessment limitations by designing multi-dimensional metrics encompassing knowledge mastery, skill application, innovative practice, teamwork, and professional ethics. Specific measures include: developing “Student Growth Portfolios” to systematically document student performance and achievements in both formal and informal learning settings; incorporating industry evaluation standards by integrating vocational skill certifications and industry competition awards into the credit recognition system; implementing a “Project Outcomes Defense System” where students present collaborative learning achievements in teams, evaluated jointly by faculty, counselors, and industry experts; establishing a dynamic feedback mechanism to promptly communicate evaluation results to faculty and students for adjusting teaching and learning strategies.

(4) Integrated Management Platform: Establishing an integrated online-offline collaborative education management platform. This integrates academic affairs systems, student affairs systems, and practical teaching platforms to achieve information sharing and resource coordination. Key functionalities include: Resource Sharing Platform: Centralized management of course resources, practical projects, industry case studies, and activity information for on-demand access by faculty and students; Project Collaboration Platform: Supports cross-classroom project publication, team formation, implementation, and outcome presentation to foster faculty-student interaction and cooperation; Data Integration Platform: Collects and analyzes multidimensional data on student learning behaviors, activity participation, and competency development to support personalized guidance and educational decision-making;

Achievement Showcase Platform: Displays collaborative learning outcomes to foster a positive educational culture.

4. Implementation Guarantees for Collaborative Education Mechanisms in Culinary Arts and Food Science Programs

To ensure effective operation of collaborative education mechanisms, a comprehensive support system must be established:

4.1 Institutional Guarantees: Refine Collaborative Education Management Systems

Develop the Implementation Measures for Collaborative Education in First and Second Classrooms, clarifying responsibilities, collaboration processes, and resource allocation principles. Establish a joint conference system for collaborative education, where academic affairs departments, student affairs departments, professional schools, and industry representatives regularly consult to resolve implementation issues. Refine the credit recognition system, standardizing criteria and procedures for awarding credits in second classroom activities.

4.2 Resource Support: Optimize Resource Allocation for Collaborative Education

Integrate campus resources such as laboratories, training bases, and innovation centers, prioritizing access for collaborative education projects. Establish a dedicated fund to support cross-curriculum course development, practical activities, and faculty training. Expand industry-university partnerships to co-build collaborative education bases, introducing real-world industry projects and cutting-edge technologies.

4.3 Cultural Support: Fostering a Collaborative Education Culture

Enhance faculty and student recognition and engagement through showcasing exemplary collaborative education cases, hosting achievement exhibitions, and honoring outstanding teams. Cultivate an open, inclusive, and collaborative teaching culture that encourages educators to transcend classroom boundaries and explore pedagogical innovation. Guide students to proactively integrate learning resources for self-directed development.

4.4 Quality Assurance: Establishing a Collaborative Education Quality Monitoring System

Develop quality evaluation metrics for collaborative education and conduct regular effectiveness assessments. Continuously refine the collaborative education mechanism by gathering information through multiple channels, including student development tracking surveys, graduate quality feedback, and employer evaluations. Introduce third-party professional institutions for assessment and certification to enhance the scientific rigor and credibility of collaborative education.

5. Conclusion

The integration of formal and informal education represents an inevitable trend in contemporary higher education reform and an intrinsic requirement for cultivating applied professionals.[14] For culinary and food science programs, establishing an effective collaborative education mechanism not only resolves the current disconnect between theoretical knowledge and practical application but also fosters versatile culinary professionals equipped with solid theoretical foundations, refined practical skills, and innovative capabilities. [15]

The proposed “three-dimensional linkage and four-dimensional integration” collaborative education mechanism, grounded in disciplinary characteristics and emphasizing systematic design and practicality, offers new insights for educational reform in culinary and food studies. However, collaborative education is a systemic endeavor whose effectiveness depends on multifaceted coordination and continuous refinement. Future efforts should explore personalized development pathways, digital support platforms, and sustainable operational mechanisms within collaborative education. Continuously enriching and advancing its theoretical foundations and practical applications will ultimately fulfill higher education's fundamental mission of fostering virtue and cultivating talent. [16-17]

References

[1] Ouyang Fangping, Sun Kehui, Long Mengqiu, et al. Exploration and Practice of Innovative Talent Cultivation Models in Physics Education at Xinjiang Universities [J]. Journal of Higher Education, 2025, 11(33): 173-175+179.

[2] Zhao Xiaoyan, Liu Pan, Zhang Hu, et al. Exploring the Enhancement of Students' Practical Innovation Abilities through Extracurricular Activities in Electrical Engineering Programs [J]. Agricultural Technology and Equipment, 2023, (07): 139-141.

[3] Li Cui, Wang Guanyu, Zhao Lili. Analysis of the Effectiveness of Cultivating Applied Talents in “New Business Disciplines” Under the New Framework: A Case Study of Qingdao University of Technology [J]. Research and Practice in Innovation and Entrepreneurship Theory, 2023, 6(06): 11-14.

[4] Wang Shaopeng. Pathways for Collaborative Education Between First and Second Classrooms in Higher Education Institutions [N]. Anhui Science and Technology News, 2025-06-11(013).

[5] Wei Changjiao, Yang Songning. Research on Integrated Education in First and Second Classrooms Under the College System [J]. Future and Development, 2025, 49(02): 55-62.

[6] Ren Qiuyan. Quantitative Analysis of the Impact of Collaborative Education in First and Second Classrooms on Students' Comprehensive Development [J]. Heilongjiang Science, 2025, 16(09): 119-121.

[7] Chen Jingxian, Yang Hui. Exploring Collaborative Education Models Between Second and First Classrooms in the Context of Cultivating Innovative Talents in Higher Education Institutions [J]. China Storage and Transportation, 2025, (05): 108-109.

[8] Luo Yihan. Cultivating Legal Professional Competencies Through Club Activities: A Case Study of Extracurricular Program Development at Zhejiang University City College School of Law [J]. Journal of Higher Education, 2022, 8(17): 143-146.

[9] Kong Lingbo. Research on the Second Classroom Education System in Higher Education Institutions Based on Holistic Human Development [D]. Wuhan Light Industry University, 2021.

[10] Wei Lili, Wang Lijuan, Shao Jingjing, et al. Construction and Practice of the “Objective-Implementation-Evaluation” System for Ideological and Political Education in First Classroom Courses [J]. University Education, 2024, (06): 79-82.

[11] Ren Cheng, Qiao Hongzhu, Yao Monan. Theoretical Research on Collaborative Education in the First Classroom and Second Classroom of Ideological and Political Education in Higher Education Institutions [J]. Education and Teaching

Forum, 2021, (28): 28-31.
[12] Duan Bo, Gao Zhenhua. Analysis of Key Elements in the Evaluation System for Second Classroom Activities in Higher Education Institutions [J]. Youth Journal (Education & Teaching Research), 2013, (02): 53.
[13] Wang Jianjun, Li Siyu. Innovative Research on the Practical Teaching System for Culinary Arts and Nutrition Education Majors [J]. Foodservice Management, 2022(3): 23-27.
[14] Chen Huirong. Research on the Collaborative Education Mechanism Between First and Second Classrooms in Higher Education Institutions [J]. Educational Exploration, 2021(5): 67-71.
[15] Zhang Hua. Pathways for Deep Integration of "Two Classrooms" in Applied Undergraduate Institutions [J]. China Higher Education, 2020(18): 45-47.
[16] Liu Zhen-tian. Theoretical Logic and Practical Pathways for Collaborative Education in Higher Education Institutions [J]. Educational Research, 2019(6): 78-83.
[17] Zhao Guo-qing, Sun Li. Second Classroom and Innovative Talent Cultivation: Mechanisms, Pathways, and Safeguards [J]. Research on Higher Engineering Education, 2021(2): 145-149.