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Research on the Construction and Practice of the Vocational College Hakka Cuisine Curriculum System Under the STEM Education Concept

Ganhong Chen, Jingxian Yang, Pingping Luo, Mingzhi Liu, Weirun Liang*

Guangdong Meizhou Vocational and Technical College, Meizhou 514011, Guangdong, China

**Author to whom correspondence should be addressed.*

Abstract: Against the dual background of the high-quality development of vocational education and the inheritance and innovation of culture, this paper addresses issues such as outdated curriculum concepts, fragmented content, and a single teaching model. Based on STEM education, it proposes strategies including reconstructing curriculum objectives, integrating curriculum content, innovating teaching models, and optimizing evaluation systems. These strategies aim to promote the transformation and upgrading of the catering industry, the inheritance and innovation of cooking skills, and the cultivation of innovative thinking and practical abilities among culinary students, thereby enhancing the construction effect of the vocational college Hakka cuisine curriculum system.

Keywords: STEM education; Vocational college education; Hakka cuisine; Curriculum system; Construction and practice

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1. Practical significance of integrating the STEM education concept into the vocational college Hakka cuisine curriculum system

1.1. Meeting the talent demand for the transformation and upgrading of the catering industry

With the rapid development of China's catering industry, the traditional catering model is gradually transforming towards intelligence and standardization. Modern catering enterprises not only require culinary practitioners to have solid cooking skills but also master multi-disciplinary knowledge and skills such as food nutrition component analysis and engineering design for standardized food production [1]. The STEM education concept emphasizes interdisciplinary integration and practical application. By integrating it into the vocational college Hakka cuisine curriculum system, this study further promotes the transformation of curriculum content from "single skill teaching" to "comprehensive literacy cultivation", cultivating more compound culinary talents who understand traditional skills, practical operations, and innovative design. This more accurately matches

the talent needs of the modern catering industry, thereby greatly enhancing graduates' employability and career development potential.

1.2. Promoting the inheritance and innovative development of Hakka cooking skills

The inheritance of Hakka cooking skills is not a simple duplication of techniques but requires innovative development based on inheriting traditional essence in response to the needs of the times. The STEM education concept provides scientific thinking methods and technical support for the inheritance and innovation of Hakka cooking skills. From a scientific perspective, teachers can deeply explore the nutritional components of Hakka cooking ingredients and the physical and chemical changes during the cooking process, which is consistent with the scientific connotation of Hakka cuisine emphasizing "the supremacy of original flavor" [2]. From a technical perspective, teachers can use modern food processing technology and intelligent cooking equipment to achieve standardized production and quality improvement of traditional Hakka dishes. The integration of STEM education and Hakka cuisine courses enables students to master traditional cooking skills while learning to examine them with scientific thinking, promoting the transformation of Hakka cooking skills from "experience-based" to "science-based", thereby achieving a higher level of inheritance and innovation.

1.3. An important path to cultivate innovative thinking and practical abilities of culinary students

Innovative thinking and practical abilities are the core literacy of high-quality technical and skilled talents in the new era. Traditional vocational college Hakka cuisine teaching mainly adopts the model of teacher demonstration and student imitation. Students usually passively accept knowledge and skills, lacking opportunities for active exploration and innovative practice, which severely restricts the development of their innovative thinking and practical abilities [3]. The STEM education concept is centered on project-driven learning. Teachers can design more real cooking project tasks to guide students to actively use interdisciplinary knowledge, such as science, technology, engineering, and mathematics, to solve practical problems in the projects. During the project implementation process, students need to independently explore ingredient characteristics and verify cooking effects. This process not only improves students' practical operation abilities but also further develops their problem awareness and exploratory spirit.

2. Prominent problems in the current vocational college Hakka cuisine curriculum system

2.1. Outdated curriculum concepts, disconnected from the needs of the times

At present, many teachers in vocational college Hakka cuisine majors still adhere to the traditional curriculum concept of "skill supremacy" when carrying out education. They focus the curriculum on teaching the skills of traditional Hakka dishes, neglecting the cultivation of students' scientific literacy, technical application abilities, and innovative thinking. In addition, the existing curriculum setup lacks an accurate grasp of the development trends of the modern catering industry, and teachers have not fully integrated the interdisciplinary integration idea emphasized by the STEM education concept. In the teaching process, teachers often adopt the traditional "master-apprentice" model, focusing more on skill imitation and duplication, and lacking explanations of the scientific principles and technical applications behind cooking. This makes it difficult for students to form systematic scientific thinking and adapt to the transformation and upgrading needs of the modern catering industry [4].

2.2. Fragmented curriculum content, lack of interdisciplinary integration design

The current vocational college's Hakka cuisine curriculum system mostly adopts a "subject-based" setup model. The curriculum content is mainly divided into three modules: professional basic courses, professional core courses, and practical training courses, with a lack of effective connection and integration between each module. Professional basic courses are relatively abstract and theoretical, disconnected from Hakka cooking practice, making it difficult for students to apply theoretical knowledge to actual cooking processes. Professional core courses focus more on teaching the skills of single dishes, lacking the integration of scientific principles, technical applications, engineering design, and mathematical methods. Practical training courses mainly consist of simple dish duplication training, lacking real project-driven training, which makes it difficult to cultivate students' comprehensive application abilities and innovative abilities [5]. Fragmented curriculum content is likely to lead students to form scattered knowledge and skill systems, making it difficult to meet the demand for compound talents in the modern catering industry.

2.3. Single teaching model, insufficient effectiveness of practical teaching

In terms of teaching models, many teachers still adopt the traditional teaching model of "theoretical explanation + demonstration operation + imitation practice". In the teaching process, teachers occupy a dominant position, and students are mostly in a passive acceptance state, lacking opportunities for active exploration and independent learning. This single teaching model is difficult to stimulate students' learning interest and is not conducive to the cultivation of students' innovative thinking and practical abilities [6]. There are also many problems in practical teaching. The practical teaching content of many schools is disconnected from the actual job needs, and teachers lack the simulation of real work scenarios and tasks in modern catering enterprises. In addition, the practical teaching guidance methods of most teachers are single, lacking a unified standard as guidance, which ignores students' individual differences and innovative needs, thereby affecting the effectiveness of practical teaching and hindering the development of students' job adaptability and innovative abilities.

3. Construction strategies of the vocational college Hakka cuisine curriculum system under the STEM education concept

3.1. Reconstruct curriculum objectives, focusing on the cultivation of interdisciplinary core literacy

To improve the construction effect of the vocational college's Hakka cuisine curriculum system under the STEM education concept, this study should attempt to further reconstruct the curriculum objective system, integrating the cultivation of interdisciplinary core literacy throughout the curriculum objectives. For this reason, this study should establish a clearer overall goal: cultivating more compound culinary talents with solid Hakka cooking skills and profound Hakka cultural literacy, so as to better meet the needs of the transformation and upgrading of the modern catering industry and the inheritance and innovation of Hakka cooking culture. At the same time, this study should further refine dimension-specific objectives, setting specific goals from six dimensions: science, technology, engineering, mathematics, cooking skills, and cultural inheritance [7]. In the science dimension, this study should help students master more physical and chemical change laws during the cooking process, enabling them to have the ability to analyze and solve cooking problems using scientific thinking. In the technology dimension, teachers can help students master modern technologies, such as intelligent cooking equipment operation and food preservation technology, so that they can have corresponding technical application and

innovation capabilities. In the engineering dimension, this study should cultivate students' engineering design capabilities such as cooking process optimization design. In the mathematics dimension, this study should cultivate students' mathematical application abilities, such as quantitative ingredient proportioning and cost accounting. In the cooking skills dimension, this study should help students proficiently master the production skills of traditional and innovative Hakka dishes. In the cultural inheritance dimension, teachers can help students deeply understand the connotation of Hakka cooking culture, enabling them to have the ability to inherit and innovate Hakka cooking culture [8].

3.2. Integrate curriculum content, constructing an interdisciplinary integrated curriculum module

In the construction of the vocational college Hakka cuisine curriculum system under the STEM education concept, this study should take the initiative to break the traditional "subject-based" curriculum setup model. Trying to be guided by the interdisciplinary integration concept of STEM education, combining the core competence needs of the Hakka cuisine major to further integrate curriculum content, so as to gradually build an interdisciplinary curriculum module system of "basic integration module + professional core integration module + practical innovation module". In the basic integration module, teachers can integrate the content of basic courses such as Culinary Chemistry, Culinary Nutrition Calculation, Mathematical Application, Banquet Design, and Nutritional Meal Preparation, and then construct a "Hakka Cuisine Basic Science and Technology" curriculum module combined with the characteristics of Hakka cuisine [9]. The curriculum content can include the analysis of nutritional components of Hakka cooking ingredients and the application of mathematics in ingredient proportioning, laying an interdisciplinary foundation for students' subsequent professional learning. For the professional core integration module, this study should optimize the professional core curriculum content oriented to the core skills of Hakka cuisine and the needs of the modern catering industry, constructing an "Innovative Production of Classic Hakka Dishes" module. For the practical innovation module, teachers should build an "Enterprise Internship" module oriented to real catering industry projects. Teachers arrange students to enter some modern catering enterprises, allowing them to participate in real catering services and food production work, thereby improving their job adaptability [10].

3.3. Innovate teaching models, implementing project-driven interdisciplinary teaching

To ensure the construction of the vocational college's Hakka cuisine curriculum system under the STEM education concept, this study should take the initiative to break the traditional single teaching model. Teachers can try to be driven by STEM education projects, implementing a new teaching model of "project-driven + interdisciplinary integration + practical exploration" [11]. In teaching, this study designs more real project tasks, combining the core competence needs of the Hakka cuisine major and the actual problems of the modern catering industry. Design more targeted and practical project tasks, each of which should clarify interdisciplinary knowledge and skill requirements, guiding students to comprehensively use interdisciplinary knowledge, such as science, technology, engineering, and mathematics, to solve project problems. In addition, teachers can also try to construct an integrated teaching process of "teaching-learning-doing-creating", deeply integrating the project implementation process with the teaching process. The specific process includes: project introduction, where teachers can introduce some real project tasks to clarify project goals and requirements; problem exploration, where students can independently explore the core problems to be solved around the project tasks, such as ingredient characteristic analysis and cooking process optimization [12]; scheme design, where students can design

project implementation schemes based on interdisciplinary knowledge in groups; practical operation, where students can carry out practical operations according to the scheme, and teachers can provide targeted guidance; achievement display and evaluation, where students can display their project achievements, and teachers, classmates, and enterprise experts jointly evaluate and put forward improvement suggestions; summary and reflection, where culinary students can summarize the experience and deficiencies in the project implementation process, which can greatly improve their comprehensive abilities. In addition, teachers can also try to use modern information technology to improve teaching effects, using modern information technologies such as online teaching platforms and virtual simulation teaching systems to enrich teaching methods.

3.4. Optimize the evaluation system, establishing a diversified process-oriented evaluation mechanism

To better break the limitations of traditional result-oriented evaluation, teachers can establish a diversified evaluation system of "process-oriented evaluation + result-oriented evaluation + diversified evaluation subjects" based on the STEM education concept, which can more comprehensively evaluate students' interdisciplinary core literacy. For this reason, this study should further improve process-oriented evaluation, incorporating students' project implementation process and innovative thinking into the evaluation scope. The specific evaluation content can include the rationality of project scheme design, the depth and breadth of problem exploration, the standardization and proficiency of practical operations, the effectiveness of team collaboration, and the feasibility of innovative points. Teachers can adopt various evaluation methods, such as classroom observation and project reports, to provide timely feedback on students' learning situation and guide students to focus on the improvement of the learning process. In addition, this study should further optimize result-oriented evaluation. Teachers can try to include students' project achievements and theoretical exams in the result-oriented evaluation scope. The evaluation of project achievements focuses on the innovation, practicality, and scientificity of the achievements, while theoretical exams focus on assessing students' mastery and application abilities of interdisciplinary theoretical knowledge [13].

In addition, teachers can try to construct a diversified evaluation subject, which can effectively break the limitation of single teacher evaluation. Teachers can introduce evaluation subjects such as enterprise experts, industry associations, and classmates. Enterprise experts evaluate students' practical abilities and job adaptability based on industry job needs; industry associations evaluate students' innovative abilities and industry competitiveness from the perspective of industry development; peer evaluation evaluates students' cooperation abilities and contributions from the perspective of team collaboration [14]. The participation of diversified evaluation subjects can improve the scientificity and pertinence of evaluation results, better matching the industry's demand for talents. To ensure the effective implementation of the diversified evaluation system, teachers also need to establish corresponding evaluation standards and processes. For process-oriented evaluation, a more detailed and quantifiable evaluation standard can be formulated. For example, the rationality of project scheme design can be quantitatively scored from aspects such as goal clarity, step completeness, and resource planning rationality; the depth and breadth of problem exploration can set scoring rules according to the scientificity of exploration methods, the depth of exploring the essence of problems, and the scope of expanding relevant knowledge. In terms of the evaluation process, multiple evaluations can be carried out according to different stages of the project, such as evaluating scheme design at the project initiation stage, conducting phased observation and feedback during the implementation stage, and conducting a comprehensive summary evaluation at the end stage [15].

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