WHIOCE PUBLISHING PTE. LTD.
PROVIDING FIRST-CLASS SCIENTIFIC INFORMATION FOR TOP SCHOLARS

2025 Volume 3, Issue 11
Lecture Notes in Education, Arts, Management and Social Science
ISSN(Online): 2705-053X

Research on the Construction and Practice of STEM Curriculum System for Hakka Cuisine Major Under the Background of Digital Empowerment

Chen Gan Hong[1], Ming Zhong[1], Weirun Liang[1]*, Yonghao Huang[2], Kengsung Chang[3]

[1]Guangdong Meizhou Vocational and Technical College, Meizhou 514011, Guangdong, China

[2]Meizhou Meixian District Technical School, Meixian District, Meizhou 514031, Guangdong, China

[3]Quanzhou College of Technology, Jinjiang City, Quanzhou 362200, Fujian, China

**Author to whom correspondence should be addressed.*

Abstract: Hakka cuisine, one of the three major local cuisines in Guangdong, carries the cooking skills and cultural spirit passed down by the Hakka people from generation to generation. It is not only a bright pearl of Chinese food culture but also an important starting point for the "Cantonese Cuisine Chef" project to promote rural revitalization. The Hakka cuisine major is an important cradle for cultivating Hakka cuisine cooking talents. It is necessary to actively construct a STEM curriculum system to help students master Hakka cuisine cooking skills and improve the quality of Hakka cooking talent training. This paper analyzes the importance of constructing a STEM curriculum system for the Hakka cuisine major, examines the current status of the major's curriculum system construction, and elaborates on four aspects: constructing STEM curriculum modules, carrying out project-based practical teaching, building a digital teaching platform, and comprehensively deepening the integration of production and education, so as to improve the teaching quality and talent training quality of the Hakka cuisine major.

Keywords: digital empowerment; Hakka cuisine major; STEM curriculum system; construction path

Online publication: December 1, 2025

1. Introduction

The Education Power Construction Plan Outline (2024—2035) clearly requires deepening the reform of vocational education assisted by artificial intelligence and cultivating high-quality technical and skilled talents adapting to the Digital China strategy. Against this background, higher vocational colleges should fully promote the digital teaching transformation of the Hakka cuisine major. Taking the construction of the STEM curriculum system for the Hakka cuisine major as the starting point, they should actively promote Hakka culture, invite inheritors of Hakka cuisine to develop the STEM curriculum system for the Hakka cuisine major, promote the integration of science, technology, engineering, and mathematics knowledge, and build a four-in-one curriculum system of "culture leadership - digital empowerment - STEM integration - practical implementation". This will improve students' Hakka cuisine cooking skills, cultivate their craftsman spirit of striving for excellence, pursuing perfection, and pioneering innovation, and promote the living inheritance and

innovative development of Hakka food culture in the digital age.

2. Importance of constructing a stem curriculum system for the hakka cuisine major under the background of digital empowerment

2.1. Empowering the living inheritance of hakka food culture

Digital technologies such as artificial intelligence, big data, and virtual simulation have innovated the inheritance method of Hakka cooking skills, which is conducive to promoting the living inheritance of Hakka food culture. With the support of digital technology, higher vocational colleges promote the construction of the STEM curriculum system for the Hakka cuisine major, use VR simulation technology and 3D modeling technology to create Hakka enclosed house cooking scenes, dynamically demonstrate the Hakka cuisine cooking process, and make Hakka cuisine cooking skills visualized and interactive. This facilitates students to practice skills such as ingredient proportioning, cooking sequence, and heat control of Hakka cuisine in virtual scenes, thereby helping students master Hakka cuisine cooking skills and promoting the inheritance of Hakka food culture [1].

2.2. Objective requirement for the digital transformation of the catering industry

Under the background of the integration of culture and tourism, the Hakka catering industry is gradually transforming towards intelligence, and the application of technologies such as intelligent cooking equipment and blockchain is becoming more and more common, which puts forward higher requirements for the digital literacy and innovative ability of Hakka cuisine chefs. The STEM curriculum system meets the objective requirements of the digital transformation of the Hakka catering industry, promotes the integration of digital technologies such as artificial intelligence, VR technology, and knowledge graphs with the teaching of the Hakka cuisine major, enabling students to master the operation skills of intelligent cooking equipment, the ability to analyze food nutritional components, and the ability to analyze customer suggestions, helping them grow into craftsman-style Hakka cuisine chefs.

2.3. Constructing an interdisciplinary education model

The integration of STEM education and digital technology breaks the barriers between courses of the Hakka cuisine major in higher vocational colleges, promotes the integration of digital technology with courses such as nutrition science and cooking practice, which is conducive to constructing an interdisciplinary education model, promoting the all-round development of students' morality, intelligence, physical fitness, aesthetics, and labor, and cultivating more craftsman-style Hakka cooking talents. The construction of a STEM curriculum system for the Hakka cuisine major can guide students to select Hakka cuisine ingredients and analyze food nutritional components using scientific thinking; guide students to cook Hakka dishes using intelligent equipment; guide students to design unique shapes of Hakka dishes; guide students to control cooking heat and seasoning dosage using mathematical thinking, further improving students' comprehensive abilities [2].

3. Current status of the curriculum system construction of the hakka cuisine major

3.1. Lack of stem elements in curriculum content

At present, the curriculum system of the Hakka cuisine major in higher vocational colleges mainly focuses on the training of traditional Hakka cuisine skills, with relatively few contents on the development of new Hakka dishes and new cooking skills, which affects the development of students' innovative thinking [3]. The existing curriculum system has relatively few courses on nutritional science, intelligent cooking equipment, and quantitative analysis of food nutrition, which limits the integration of traditional Hakka cooking skills with digital technology and affects the development of students' scientific

thinking, cooking skills, and innovative abilities.

3.2. Single application scenario of digital technology

The teaching of the Hakka cuisine major still mainly adopts the traditional model of "theory + practical operation". It rarely uses VR technology for virtual simulation teaching or big data for teaching evaluation, which affects the teaching quality of professional courses. For example, the school ignores the construction of a digital teaching resource library for the Hakka cuisine major, only uploading Hakka cuisine cooking videos and courseware, ignoring the use of big data to push personalized learning resources for students and the use of VR technology for virtual simulation practical teaching. It is difficult to guide students to repeatedly practice Hakka cuisine cooking skills in virtual scenes, which affects the teaching quality of the Hakka cuisine major.

3.3. Imperfect integration mechanism of production and education

At present, the integration of production and education for the Hakka cuisine major mainly focuses on on-the-job internships, and there is a lack of in-depth cooperation between schools and enterprises, which is reflected in the following two aspects. First, schools and enterprises ignore the joint establishment of a virtual simulation training base for Hakka cooking, resulting in the difficulty of integrating new industry process specifications, new dishes, and intelligent cooking equipment into professional course teaching. Second, the linkage between schools, enterprises, and associations is insufficient, and they have not jointly developed STEM courses and project-based training manuals for the Hakka cuisine major, leading to the disconnection between curriculum content and industry needs, which affects the quality of Hakka cooking talent training [4].

4. Construction path of the stem curriculum system for the hakka cuisine major under the background of digital empowerment

4.1. Constructing STEM curriculum modules for the hakka cuisine major

Based on the background of digital empowerment, higher vocational colleges should clarify the relationship between the STEM education concept and the curriculum system of the Hakka cuisine major, construct STEM curriculum modules, which are divided into three dimensions: basic layer, core layer, and expansion layer, and improve the curriculum system of the Hakka cuisine major, laying a good foundation for improving professional teaching quality and talent training quality.

First, the basic layer focuses on consolidating the digital literacy and cultural foundation of students majoring in Hakka cuisine. Courses such as AI Tool Application, Hakka Food Culture, and Hakka Folk Customs and Banquet Culture are offered to guide students to use AI tools to collect Hakka cuisine cooking videos and Hakka cuisine culture, improving their digital literacy and cultural confidence [5].

Second, the core layer focuses on improving students' Hakka cuisine cooking skills, divided into four major practical training tasks. (1) Science (S) module: Guide students to learn the main dishes, ingredients, and nutritional science of Hakka cuisine, help them understand the nutritional principles of the "salty, fragrant, and fatty" characteristics of Hakka cuisine, and guide them to analyze Hakka cuisine ingredients and cooking processes using food chemistry and food nutrition knowledge, improving their scientific thinking. (2) Technology (T) module: Offer courses such as Intelligent Cooking Equipment Operation and Development of Cooking Digital Resources, explain the intelligent equipment used in the cooking process of Hakka cuisine, simulate the cooking process of famous Hakka dishes using VR technology, restore traditional Hakka cuisine skills, and encourage students to develop new Hakka dishes, improving their innovative abilities. (3) Engineering (E) module: Offer Hakka Cuisine Shape Engineering Design and Catering Space and Banquet Layout to explain the unique shapes of Hakka cuisine to students, such as the cutting angle of shredded cucumber, the plate art of stuffed tofu, and the layout of Hakka banquets, improving students' aesthetic and practical abilities. (4) Mathematics (M)

module: Offer Application of Cooking Mathematics and Catering Data Analysis courses to guide students to analyze the ingredient proportioning, heat control, and dosage of various seasonings of Hakka dishes using mathematical thinking, cultivating their professional spirit of striving for excellence, meticulousness, and pursuit of perfection [6].

Third, the expansion layer actively connects with industrial development and enterprise job needs, offering courses such as Digital Innovative Design of Hakka Cuisine and Intelligent Catering Operation and Management, connecting with the standards of cooking-related vocational skill level certificates and vocational skill competitions, and building a "post-course-competition-certificate" curriculum system. Students are encouraged to actively obtain relevant certificates to improve their employment competitiveness. At the same time, this module includes practical teaching of creative Hakka cuisine design, encouraging students to collect short videos of Hakka cuisine on Douyin and design creative dishes, stimulating their innovative thinking and laying a good foundation for their employment.

4.2. Carrying out project-based practical teaching of hakka cuisine

Teachers of the Hakka cuisine major should actively carry out project-based practical teaching, carefully design project-based practical training cases based on famous Hakka dishes, encourage students to form groups freely, let them cooperate to complete the cooking tasks of famous Hakka dishes, design creative Hakka dishes using AI technology, and allow each student to deeply participate in practical training teaching, thereby improving students' digital technology application ability, Hakka cuisine cooking skills, and innovative ability. First, teachers can issue project-based practical training tasks for Hakka "stuffed" dishes, requiring each group to make a "stuffed" dish, design a creative "stuffed" dish using AI, and shoot a cooking video, which is shared in the class group to promote communication among students and improve the quality of practical training teaching of the Hakka cuisine major using AI technology [7]. Some groups cooked the famous Hakka dish—stuffed tofu, used AI tools to analyze the main ingredient proportioning and nutritional component content of stuffed tofu, and mastered the proportioning of meat filling and the cooking heat of tofu, ensuring both the beauty and completeness of the tofu shape and the freshness of the filling. Some groups used DeepSeek software to automatically generate creative stuffed tofu dishes, tried to use fresh shrimp and crab meat as filling, and designed unique plate shapes using green leafy vegetables, making the creative stuffed tofu dishes both beautiful and delicious. Second, teachers should do a good job in patrol guidance during project-based teaching, timely point out the problems existing in each group during the cooking process of Hakka cuisine, help them improve the taste and beauty of the dishes, and improve the quality of project-based practical training teaching. Finally, teachers should encourage each group to display the finished products of Hakka "stuffed" dishes, let each group take turns tasting the dishes, and evaluate the taste, shape, heat, and creativity of each dish, promoting communication among different groups and students, helping students improve the cooking plan of Hakka "stuffed" dishes, and enhancing their cooking ability and innovative ability of Hakka "stuffed" dishes [8].

4.3. Building a digital teaching platform for the hakka cuisine major

First, higher vocational colleges should actively build a virtual simulation training base for the Hakka cuisine major, introduce intelligent cooking equipment, VR glasses, and VR helmets, optimize the practical training teaching environment of the Hakka cuisine major, and allow students to practice cooking skills of various Hakka dishes in virtual scenes, thereby improving their comprehensive abilities. For example, teachers can use VR technology to create a cooking scene of pork belly wrapped chicken, requiring students to select appropriate ingredients and control the boiling temperature, allowing them to master the pork belly cleaning method, pork belly cooking temperature, and pepper dosage, facilitating their repeated online practice, avoiding food waste, and improving students' practical abilities [9]. Second, the school should regularly update the digital teaching resources of the Hakka cuisine major, divided into modules such as creative Hakka cuisine design, Hakka cuisine cooking skills, and Hakka cuisine new media operation, facilitating students to automatically retrieve relevant digital learning resources and meet their personalized learning needs. In addition, the school should intelligently summarize students' retrieval data, online messages, and courseware download volume on the digital teaching platform to achieve precise push, helping students conduct independent review, master Hakka cuisine cooking skills,

further improve the STEM curriculum system of the Hakka cuisine major, and thus improve the teaching quality of the major.

4.4. Comprehensively deepening the integration of production and education and school-enterprise cooperation

First, the school should strengthen cooperation with hotels, invite famous Hakka cuisine chefs and inheritors to serve as part-time teachers, build a full-time and part-time "dual tutor" team, allowing students to timely understand new Hakka dishes and new cooking skills, thereby improving their on-the-job practical abilities and laying a good foundation for their employment. For example, famous Hakka cuisine chefs can explain creative Hakka dishes, banquet dish design and cooking skills to students, and guide them to cook hand-in-hand, allowing students to accurately master skills such as Hakka cuisine ingredient proportioning, heat control, and new dish design, enabling them to master digital cooking equipment and Hakka cuisine data analysis skills, and improving students' digital technology application ability and innovative ability. Second, schools and enterprises should jointly develop STEM interdisciplinary integrated loose-leaf textbooks, starting from aspects such as traditional Hakka cuisine cooking skills, Hakka cuisine banquet design, Hakka culture, AI-led creative Hakka cuisine design, and Hakka cuisine new media marketing. The content of the loose-leaf textbooks can be flexibly added or deleted according to industrial development and students' learning conditions, further improving the construction quality of the STEM curriculum system for the Hakka cuisine major [10].

5. Conclusion and outlook

In summary, digital technology has injected vitality into the construction of the STEM curriculum system for the Hakka cuisine major, promoted the integration of industrial development, job skills, and course teaching, which is conducive to promoting Hakka food culture, enhancing students' cultural confidence, and encouraging them to design creative Hakka dishes and innovate traditional Hakka cuisine cooking skills. In the future, higher vocational colleges should try to use artificial intelligence to build an industry-university-research cooperation platform, invite famous Hakka cuisine chefs to carry out remote online teaching, use big data to conduct teaching evaluation, improve the STEM curriculum system for the Hakka cuisine major, and promote the high-quality development of Hakka cuisine professional education.

Funding

Meizhou Municipal 13th Planning Project of Education Scientific Research (Project No.: MZ13YBKT022)

Disclosure statement

The author declares no conflict of interest.

References

[1] Guangdong Vocational Education Association, 2022, *Inheriting Hakka Skills, Demonstrating Cultural Confidence, and Boosting Rural Revitalization: Innovation and Practice of the Talent Training Model for the Cooking Major*.

[2] Guan SY, 2025, Exploring the Practical Path of Cultural Inheritance and Innovation in the Chinese Cuisine Cooking

Major of Secondary Vocational Schools——Taking the Development of the Longevity Hezhou Hakka Cuisine Culture Inheritance Vocational Education Base of Guangxi Wuzhou Agricultural School as an Example. *Food Industry*, (03): 66-68.

[3] Wu XC, Liu Y, Huang YQ, et al., 2025, Investigation on the Current Situation and Inheritance of Heyuan Hakka Cuisine Cooking Skills from the Perspective of Intangible Cultural Heritage. *The Food Industry*, 46(02): 279-283.

[4] Wei YZ, 2021, Meizhou Agricultural School Inherits Hakka Skills and Cultivates a Fertile Ground for Talents. *Guangdong Education (Comprehensive Edition)*, (10): 22-23.

[5] Liu Y, Chen JH, Chen GW, et al., 2023, Design and Application of the Hakka Longevity Theme Banquet. *The Food Industry*, 44(11): 229-232.

[6] Wen DG, 2024, The Integration of Hakka Culture and Commercial Architecture——Taking the Hakka Cuisine Food Culture Creative Base Project in the Hakka Capital as an Example. *Urban Development*, (12): 151-153.

[7] Xie JF, 2022, Research on the Food Culture of Dongjiang Hakka——Taking the Inheritance and Development of Heyuan Hakka Cuisine as an Example. *Light Industry Science and Technology*, 38(05): 121-122+131.

[8] Zeng C, Lin SX, Luo PP, 2024, Integration and Practice of Hakka Culture and the Construction of "Ideological and Political Education in Courses" for the Cooking Major in Local Higher Vocational Colleges. In *Proceedings of the Seminar on Ideological and Political Education, Party Building and Culture and Art Education: Cultivating Soul and Educating People·Integration and Innovation* (pp. 174-176). China Popular Literature and Art Research Association.

[9] Liu Y, Chen GW, Chen JH, 2022, A Brief Discussion on the Inheritance and Development of Meizhou Hakka Cuisine. *Modern Food*, 28(16): 113-116.

[10] Liu Y, Wu XC, 2023, Research on Banquet Design and Practice from the Perspective of Cooking Skills Competition——Taking the Hakka Hometown Rhyme Banquet as an Example. *The Food Industry*, 44(12): 275-278.