



Iterative Optimization Practice of Higher Vocational Web Development Courses Under the Background of Double High-Level Construction

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Abstract. Against the backdrop of the first round of China's Double High-Level Plan for vocational education, this paper explores curriculum construction, focusing on the iterative optimization of the core Web development course for a key supporting major in the Double High-Level professional group. The course has undergone five stages: "Promoting Reform through Competitions - Provincial Characteristics - Ideological and Political Guidance - Three-Dimensional Upgrading - Innovation and Boundary Expansion". From the integration of post, curriculum, competition and certificate, to the integration of curriculum ideological and political education, innovation-entrepreneurship and bilingual resources, it has developed from school-based practice to provincial excellence, national recognition and international integration. An innovative teaching system of "One Core, Dual Engines, Four-Dimensional Drive and Three Aspects, Five Lines, Multiple Points for Soul Casting" is constructed, demonstrating progressive innovation in teaching mode, curriculum ideological and political education, digital empowerment and industry-education integration. By updating teaching content, methods and resources, it effectively solves the pain points of traditional courses such as post-curriculum disconnection, separation of morality and skills, and inefficient classrooms. Practice proves the curriculum iteration has significantly improved talent training quality, won multiple provincial and national honors, and formed a replicable paradigm, providing practical and theoretical references for the dynamic optimization and accurate alignment of vocational education curriculum reform.

Keywords: Double High-Level Construction; Curriculum Construction; Web Development; Iterative Optimization

1 Introduction

Launched in 2019 by China's Ministry of Education and Finance, the Double High-Level Plan is the vocational education "Double First-Class"[1], aiming to build world-class vocational colleges and professional groups, advance curriculum reform and industry-education integration, and cultivate technical talents for regional development. As the first round progresses, curriculum construction is pivotal to professional development and talent training[2]. Information technology courses, a digital economy backbone, shape students' employability, yet traditional Web development courses face outdated teaching, weak morality-skill integration and low engagement amid relevant reforms, becoming a key higher vocational reform focus[3].

At Jiangxi University of Applied Technology, Computer Application Technology supports the A-level Land and Resources Survey and Management Double High-Level professional group. Taking its core Web Front-end Development as the focus, adhering to "information technology serving local industries", the course evolved through five stages, built the innovative "One Core, Dual Engines, Four-Dimensional Drive and Three Aspects, Five Lines, Multiple Points for Soul Casting" system, and realized comprehensive reform via local elements, school-enterprise cooperation and digital empowerment.

This paper summarizes the course's iterative path and experience, focusing on curriculum optimization, teaching innovation, ideological education integration, digital resources and achievement promotion, providing practical and theoretical references for vocational education curriculum reform.

2 Construction Foundation of Curriculum Reform

2.1 Policy Guidance and Double High-Level Construction Drive

China's vocational education is undergoing deep reform and systematic upgrading, with national policies like the National Plan for Vocational Education Reform providing clear guidance for higher vocational curriculum reform. The Double High-Level Plan prioritizes high-level professional groups and quality curriculum systems[4], with the integration of post, curriculum, competition and certificate, three teaching elements reform and curriculum ideological and political education as core tasks. As a core course of Computer Application Technology, the reform of Web Front-end Development is critical to the quality of professional group construction and the connotative development of the Plan.

2.2 Regional Industrial Development Needs and Insufficient Curriculum Adaptability

Jiangxi's 14th Five-Year Plan prioritizes electronic information and digital economy, with industrial and software parks built in Ganzhou and Nanchang raising higher de-

mands for compound Web development talents. As a supporting major of the university's A-level Land and Resources Survey and Management Double High-Level professional group, Computer Application Technology needs a well-structured, skill-oriented curriculum system that equally emphasizes morality and skills to meet local industrial needs. Yet traditional Web courses suffer from lagging technology, industry-disconnected project cases and poor matching between students' abilities and job requirements, which hinders the professional group's capacity to serve regional development[5].

2.3 Existing Construction Achievements and Curriculum Reform Foundation

Leveraging the Double High-Level Plan, the university has developed provincial excellent online courses and ideological and political demonstration courses, and participated in national teaching resource database construction, forming a solid resource foundation. The Web development teaching team has honed teaching content and methods through various competitions, accumulating rich reform experience and practical cases. Focusing on curriculum-industry connection, value guidance and student ability improvement, the team has built a comprehensive curriculum reform system, laying a solid foundation for high-quality curriculum construction.

3 Path and Stage Distribution of Curriculum Iterative Optimization

Centering on Web Front-end Development, the major built a progressive and systematic iterative path during the Double High-Level Construction, going through five stages: Promoting Reform through Competitions, Provincial Characteristics, Ideological and Political Guidance, Three-Dimensional Upgrading, Innovation and Boundary Expansion, which realized the overall improvement of curriculum content, resources, educational functions and teaching methods.

3.1 Promoting Reform through Competitions: Guiding Content Reconstruction with Skills Competitions as the Starting Point

In 2018-2019, the initial stage of the Plan, the course took teachers' and students' skills competitions as dual drives, integrating competition standards into teaching to promote curriculum content reconstruction and teaching method reform. The teaching team won national and provincial teaching ability competition awards; teaching content was transformed into a project-based modular structure, focusing on practical tasks and enhancing students' hands-on abilities. Classroom participation, project completion quality and activity all increased by over 40%.

3.2 Provincial Characteristics: Promoting Resource Reconstruction through Excellent Curriculum Construction

In 2020, the promotion year of Double High-Level Construction, the course "Web Front-end and Back-end Data Interaction Technology" was rated as an excellent online open course in Jiangxi Province, marking that the construction of the curriculum resource system has entered a systematic stage. The course fully integrates the concept of "integration of post, curriculum, competition and certificate", explores and constructs an online-offline blended teaching mode of "One Core, Dual Engines and Four-Dimensional Drive", and builds a modular curriculum content of "task orientation + comprehensive project training" with three modules. Relying on the curriculum teaching platform, it realizes the integrated resource layout of video micro-courses, practical training guidance, interactive evaluation, expansion resources, etc., forming a learning support system throughout the whole teaching process to meet the personalized learning needs of students with different learning foundations. At the same time, the teachers' teaching ability competition was further deepened, connecting the curriculum content with industry standards and vocational qualification certifications, promoting the coordinated improvement of resources and standards.

3.3 Ideological and Political Guidance: Integration Path of Curriculum Ideological and Political Education with Regional Characteristics

In 2022, the course was rated a Jiangxi provincial curriculum ideological and political demonstration course, realizing the systematic integration of ideological and political elements. It built the "Three Aspects, Five Lines, Multiple Points" design mode, integrating regional characteristics like Gannan Soviet Area Spirit and school's rock climbing spirit into teaching tasks. By reconstructing educational objectives and optimizing evaluation indicators, it enhanced teachers' ideological and political awareness, and built the six-step teaching links to cultivate students' technical ethics, social responsibility and comprehensive quality.

3.4 Three-Dimensional Upgrading: Digital Empowerment Promoting the Reform of Teaching Methods

In 2023, the achievement year of Double High-Level Construction, the course was rated a typical case of Jiangxi's "Classroom Revolution", published the loose-leaf textbook Web Front-end and Back-end Data Interaction Technology, and became a core course of the national professional teaching resource database with all-round upgraded teaching resources and methods. It built the "Dual Spaces, Four Platforms and Six Resources" system, forming a full-chain teaching ecology via four integrated learning platforms and six types of school-enterprise co-constructed resources. Combined with task training work orders, students conduct self and peer evaluation, forming a diversified "process + achievement" evaluation mode and a three-stage "literacy + knowledge + ability" assessment, effectively enhancing their autonomous learning and comprehensive application abilities.

3.5 Innovation and Boundary Expansion: Integration and Expansion of Bilingual and Innovation-Entrepreneurship Courses

In 2024, the course stepped into the "curriculum + innovation and entrepreneurship + internationalization" stage, winning the national "Integration of Specialty and Innovation" golden course title. It built bilingual curriculum resources for Sino-Russian cooperative education, integrated innovation and entrepreneurship concepts into teaching modules[6], and developed English teaching resources aligned with international vocational competition standards. This realized the unification of international and local industrial needs, expanded the course to an international vision, and improved the innovative teaching system. As shown in Figure 1, the entire iterative construction process of the course

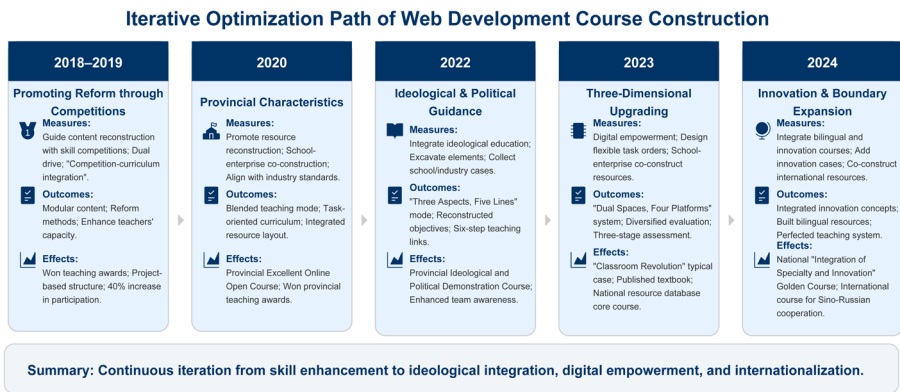


Fig. 1. Path Diagram of Curriculum Iterative Optimization

In summary, the course completed comprehensive and multi-dimensional optimization and upgrading of its structure, resource system, educational functions, teaching methods and expansion paths through the five-stage evolution.

4 Construction of the Teaching System of "One Core, Dual Engines, Four-Dimensional Drive and Three Aspects, Five Lines, Multiple Points for Soul Casting"

4.1 Constructing the Teaching Mode of "One Core, Dual Engines, Four-Dimensional Drive" to Realize the Connection between Teaching and the Post Requirements of Industrial Development

Schools and enterprises jointly explored the professional skills and literacy required for Web front-end and full-stack engineers. Driven by the integration of post, curriculum, competition and certificate and curriculum ideological and political education, the Web

development course group system was optimized, with skill points integrated into modular curriculum content by aligning with WorldSkills Competition and "1+X" assessment standards, forming a three-level module system from single skill to comprehensive post ability. Project and task-driven teaching guided students to design page themes combined with regional industrial development, cultivating students' four-dimensional abilities including ideological and political literacy, professional skills, innovative practical ability and lifelong development ability, and enabling teaching to accurately meet social talent demands.

4.2 Creating the "Three Aspects, Five Lines, Multiple Points" Curriculum Ideological and Political Design Mode to Integrate Regional Characteristics and Cultivate Both Morality and Skills

The mode integrated school characteristics (rock climbing spirit), regional culture (Gannan Soviet Area Spirit) and corporate culture (e.g., Huawei). It sorted out five ideological and political lines (identity, family and country, responsibility, standardization, innovation) from individual, enterprise and national levels, and excavated diverse ideological and political points such as information security and industry norms. Based on typical work tasks, 19 progressive sub-tasks were designed with cutting-edge and regional hot cases as themes (e.g., Gannan navel orange e-commerce page, Gannan bamboo carving intangible cultural heritage development). Interactive ideological and political elements were dynamically introduced in classrooms based on actual situations, improving the efficiency of moral education.

4.3 Establishing Six-Step Dynamic Educational Links and "Dual Spaces, Four Platforms and Six Resources" to Realize Rigorous and Vivid Programming Teaching

The six-step teaching links of "Exploration, Guidance, Research, Practice, Evaluation and Expansion" were established, with ideological and political education integrated into each link via scenario-based teaching. Group cooperation and practical tasks were used to strengthen professional skill training, and multi-dimensional evaluation was adopted to guide students to form industry norms awareness, realizing the integration of professional learning and moral cultivation.

The "Dual Spaces, Four Platforms and Six Resources" system was constructed, including smart classrooms and provincial mass innovation spaces, four integration learning platforms (virtual training, teaching, Pre-service Pass, ICT Network College), and six types of school-enterprise co-constructed resources (bilingual micro-courses, knowledge-question-ability maps, etc.). Digital and intelligent means were applied to highlight key and difficult points, activate classroom atmosphere, and improve students' learning initiative.

5 Achievements of Curriculum Reform

The course has been upgraded to a national professional teaching resource database core course, a provincial ideological and political demonstration course, a national "Integration of Specialty and Innovation" golden course, and a Jiangxi "Classroom Revolution" typical case, with a bilingual resource system for Sino-Russian cooperation and a published loose-leaf textbook; the teaching team won national and provincial teaching ability competition awards. In five years, 5,701 students were trained, with 42% higher classroom participation, 28% higher excellent coding rate, over 1,500 Huawei-certified students (45 HCIE), and 30% more graduates in the major. Students won 8 national vocational skills competition awards and "Internet +" gold/silver awards; the team built 4 national and 7 provincial courses, edited 7 textbooks, undertook 2 national and 27 provincial projects, and won national and provincial teaching achievement awards, with many teachers receiving provincial honors. The achievements were promoted in 9 colleges and 3 secondary vocational schools; 4 national resource database courses were cited by 128 colleges (800,000+ visits), reported by national media, and the college was an Excellent Huawei ICT College for four consecutive years, sending over 600 talents to the Guangdong-Hong Kong-Macao Greater Bay Area and supporting local development.

6 CONCLUSION

This paper summarizes the iterative optimization practice of Web Front-end Development for the Double High-Level professional group, forming a curriculum reform path of post-oriented, resource-integrated and morality-skill integrated development. The reform advances through competition-driven content reconstruction, resource construction-supported teaching transformation, full-process value guidance via curriculum ideological and political education, and digital-international integrated expansion. The course has formed a progressive achievement transformation path in content, resources and teaching methods, achieving remarkable educational effects. It provides replicable and promotable experience for higher vocational colleges to build industry-adaptive and local service-oriented curriculum reform paths, and offers practical references for the high-quality development of vocational education curriculum construction under the Double High-Level Plan.

Acknowledgments

*This article is the research result of the Humanities and Social Sciences Research Project of Colleges and Universities in Jiangxi Province, Project Number: JC23246. This article is the research result of the Teaching Reform Research Project of Vocational and Adult Education in Jiangxi Province, Project Number: JXJG-25-52-7, Project Title: Research on the "Double Standards and Three Stages" Development of Web-related

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