An Empirical Study on the Pedagogical Reform of E-Commerce Programs in Higher Vocational Colleges in the "Internet Plus" Era

Yanli Peng

Dehong Vocational College,Mangshi, Dehong Prefecture, Yunnan Province China 678400

Abstract: In the context of the “Internet Plus” era, e-commerce majors in higher vocational colleges face a disconnect between their curricula and industry needs, a scarcity of practical teaching resources, and insufficient school–enterprise collaboration. Drawing on both a literature review and field research, this paper proposes a systematic reform framework across four dimensions: restructuring teaching philosophy, optimizing course content, adopting project-driven industry–education integration, and building informatized teaching resources and platforms. A pilot implementation at one vocational college demonstrates that these reforms significantly enhance students’ hands-on skills, innovative awareness, and employability. Finally, based on issues encountered during implementation, the paper offers recommendations for ongoing improvement, with the goal of providing a replicable model for e-commerce teaching innovation in vocational settings.

Keywords: Internet Plus era; higher vocational colleges; e-commerce; teaching reform; industry–education integration; informatization

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Introduction

With the rapid advancement of information technology and the comprehensive rollout of the “Internet Plus” strategy, e-commerce has evolved from a mere transaction tool into a critical engine that permeates production, management, and service across industries, supporting regional economic growth and industrial upgrading. As the main training ground for technical and skilled talent, higher vocational colleges bear the responsibility of producing graduates who combine practical expertise with innovative capacity. Yet many institutions still struggle with outdated curricula, insufficient hands-on resources, shallow school–enterprise partnerships, and limited use of digital teaching platforms, making it difficult to meet employers’ demand for versatile graduates skilled in both e-commerce operations and technical development.This study combines a literature review with on-site investigation to dissect the current state of e-commerce education at a representative vocational college. Using surveys, interviews, and case tracking, it identifies key bottlenecks hindering teaching quality and then proposes reform strategies centered on teaching philosophy reconstruction, curriculum optimization, project-driven industry–education integration, and the development of digital teaching resources and platforms. Multidimensional evaluation metrics quantify

the impact of these reforms, and improvements in students ' practical abilities, innovative thinking, and employability are analyzed to demonstrate both feasibility and scalability. The ultimate aim is to offer actionable, replicable insights for vocational colleges seeking to innovate their e-commerce programs and to strengthen the synergy between modern vocational education and regional e-commerce industries.

1 Theoretical Basis and Literature Review

1.1 E-commerce Theories in the "Internet Plus" Era

The " Internet Plus " era represents a paradigm shift in which internet technologies underpin the reinvention of traditional economic and managerial institutions. Within this context, four foundational theories illuminate how e-commerce transforms markets and organizations.At the heart of modern e-commerce lies the concept of platforms as digital intermediaries. These platforms bring together buyers, sellers, and an array of third-party service providers — payment processors, logistics firms, and risk-management specialists — into a single, integrated marketplace. As more participants join the platform, network externalities emerge: each additional user or service amplifies the platform ' s value to all others, generating a self-reinforcing cycle of growth. For example, a global marketplace that adds new payment options not only attracts more buyers but also encourages more sellers to list their products, strengthening the platform ' s position as a go-to sales channel.E-commerce has fundamentally altered transaction costs — the expenses associated with searching for information, bargaining, and enforcing contracts[1]. By delivering real-time price comparisons, automated ordering systems, and secure digital contracts, online marketplaces drastically reduce these frictions. Consumers can instantly compare thousands of product listings, while sellers can manage orders through centralized dashboards. This transparency and efficiency not only lower operational overhead but also enhance market competitiveness, enabling smaller firms to participate in global trade with the same ease as established brands.The long-tail theory reconciles two seemingly opposing strategies — offering a vast selection of products while meeting highly specific consumer preferences. Traditional retail models rely on stocking only best-selling items, constrained by physical shelf space. In contrast, e-commerce platforms can list millions of niche products at minimal marginal cost. By harnessing big data analytics and personalized recommendation algorithms, platforms can match individual users with specialized offerings—whether artisanal crafts or obscure collectibles — thus unlocking new revenue streams from what was once considered marginal demand[2]. Over time, the cumulative sales of these niche items may rival or exceed those of mainstream products, driving sustainable growth.Beyond individual transactions, e-commerce operates within a broader digital ecosystem encompassing supply-chain management, financial services, marketing automation, and customer relationship management. In this interconnected environment, participants — including manufacturers, logistics providers, fintech startups, and end-users — collaborate through open APIs and shared data

standards. Such ecosystems enable real-time coordination: inventory levels update automatically across warehouses, dynamic pricing adjusts to market fluctuations, and personalized promotions target individual consumer segments. This closed loop of "technology–resources–demand" fosters resilience and innovation, as ecosystem members co-create value and rapidly adapt to emerging trends.Collectively, these four theoretical lenses — platform economics, transaction cost reduction, the long-tail effect, and digital ecosystems — provide a robust framework for designing e-commerce curricula. By translating these concepts into case studies, simulation exercises, and hands-on projects, vocational programs can equip students with both the strategic insight and practical skills required to thrive in the "Internet Plus" marketplace[3].

1.2 Domestic and International Research Trends

Domestic scholars have conducted a wealth of research on reforming e-commerce instruction in vocational colleges under the "Internet Plus" framework. A major strand of investigation centers on constructing robust industry–education integration models. These studies detail how joint training bases — where enterprises and schools co-invest in shared facilities — can expose students to authentic production environments and streamline the transition from campus to workplace[4]. Order-driven curricula, another popular approach, involve tailoring lesson plans and project tasks to specific corporate needs, ensuring that graduates possess the precise skills demanded by hiring partners. Complementing these structural innovations, many researchers have explored blended and flipped-classroom pedagogies. By embedding MOOCs, micro-lectures, and interactive case studies into traditional teaching schedules, educators report heightened student engagement, deeper conceptual understanding, and greater peer collaboration.Assessment reform is another vibrant area of domestic inquiry. Rather than relying solely on written examinations, scholars propose a multifaceted evaluation system combining enterprise-led project appraisal, ongoing formative feedback, and competency portfolios that document each student's evolving skill set. Preliminary findings suggest that this diversified assessment matrix not only offers a more nuanced reflection of student progress but also strengthens university–industry ties, as enterprises participate directly in grading real-world assignments. In addition, emerging research underscores the role of digital simulation labs, augmented reality scenarios, and virtual reality environments in supplementing hands-on training, thereby helping students develop operational proficiency even before entering actual production facilities.Internationally, vocational institutions in Europe, North America, and parts of Asia have pioneered e-commerce education innovations for over a decade. In Germany's dual-system model, for example, students split their time between classroom instruction and paid apprenticeships, earning credentials recognized by both academic and industrial bodies[5]. In the United States, community colleges have forged partnerships with major online retailers to co-design courses on data analytics, digital marketing, and user-experience

(UX) design—core competencies that transcend traditional e-commerce boundaries. Singapore's polytechnic sector similarly integrates agile project management, blockchain-based logistics modules, and mobile-first commerce strategies into its syllabus, ensuring that graduates remain at the cutting edge of global trade practices.Furthermore, global research highlights the transformative power of Open Educational Resources (OER) and international learning communities. Platforms such as Coursera, edX, and MIT OpenCourseWare offer open-access modules in big data, supply-chain analytics, and social media commerce, enabling students from diverse regions to collaborate on cross-cultural projects and benchmark their skills against international standards. Studies also emphasize micro-credential frameworks—earned through short, competency-focused courses—that facilitate lifelong learning and rapid skill updating in response to market shifts. Taken together, these international paradigms stress ecosystem-based teaching platforms and continuous capability development mechanisms, offering valuable insights for China's vocational colleges as they strive to align e-commerce education with both national priorities and global best practices[6].

2 Current State Analysis of E-commerce Program Teaching in Higher Vocational Colleges

2.1 Existing Teaching Model and Curriculum Structure

At present, higher vocational colleges typically employ a three-stage approach for their e-commerce programs: classroom theory, on-campus practical training, and enterprise internships. Classroom instruction is dominated by instructor-led lectures, supplemented with slide presentations, case studies, and video demonstrations. On-campus training relies on simulated e-commerce platforms to drill operational workflows, while enterprise internships consist of short rotational placements that emphasize observation and basic business tasks.In terms of curriculum, the major comprises twelve required courses and eight electives, totaling around 60 credits and covering fundamentals, operations, technology, and data analysis. However, theoretical lessons account for roughly 70% of total contact hours, with practical sessions making up only about 30%, and the share of industry-co-developed courses remains limited[7].

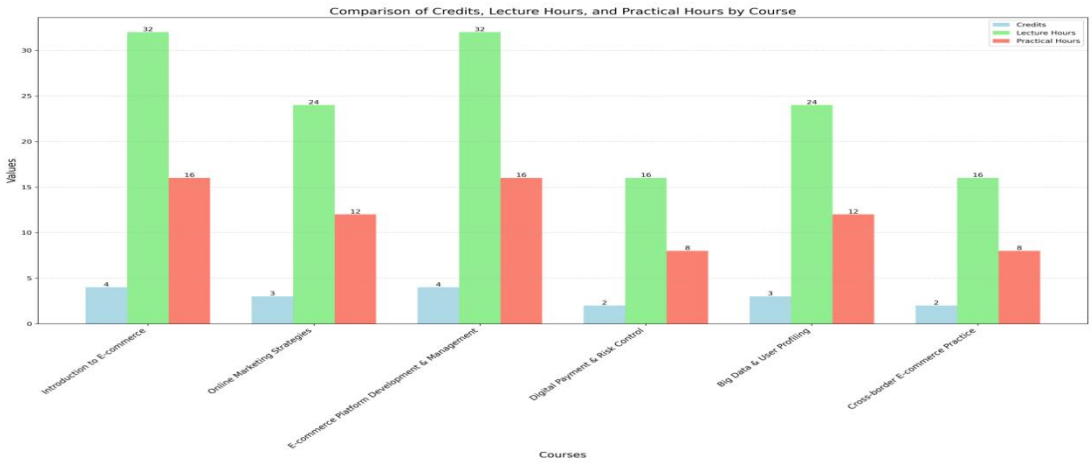

Figure 1: Core Compulsory Course Credits and Practical Proportion

The Figure 1 indicates that although core required courses maintain a balanced mix of theory and practice, elective offerings provide relatively few hands-on hours. Future reforms should deepen practical components and expand industry collaboration within these electives.

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2.2 Main Challenges and Issues

Under the "Internet Plus" paradigm, the e-commerce sector is evolving at a breakneck pace, yet vocational college curricula struggle to keep up. Emerging practices such as social commerce, livestream selling, and cross-border trade are slow to enter syllabi, leaving students without exposure to critical skills in platform operations, data analytics, and user growth strategies. Lengthy revision cycles for textbooks and syllabi mean that by the time new content arrives on campus, industry has already moved on[8].

Moreover, on-campus training largely revolves around simulated case work rather than end-to-end project management in real business contexts. As a result, students lack experience navigating full e-commerce workflows, collaborating in teams, and responding to live operational challenges. Faculty expertise also presents a bottleneck: many instructors come from traditional business or IT backgrounds and have limited firsthand familiarity with cutting-edge e-commerce technologies and practices. Although schools have established partnerships with companies, these often amount to formal agreements and brief internships, without sustained enterprise-mentor involvement, joint curriculum development, or co-assessment of student performance[9]. Finally, assessment methods still lean heavily on written exams and basic skill tests, neglecting the cultivation of innovation, data-driven problem-solving, and collaborative abilities. Together, these factors constrain the overall quality of talent development in vocational e-commerce programs.

3 Teaching Reform Overview and Strategies

3.1 Reconstructing Teaching Philosophy and Objectives

To align with rapid industrial change in the "Internet Plus" era, e-commerce education must pivot from a knowledge-transfer model to one centered on comprehensive competency development. First, an "industry-first, learning-applied" ethos should guide curriculum design. Schools can achieve this through co-developed courses with enterprises, enterprise mentors embedded on campus, and project-driven learning that places students in simulated and live business environments. Classroom delivery should evolve into a blended model that combines flipped-classroom techniques, collaborative inquiry, and case discussion to foster active learning and cross-team collaboration[10].

Second, teaching objectives should be defined across three dimensions:Professional Competency: Students must master core skills in platform setup and management, big data analysis and user profiling, network marketing planning and execution, and payment security and risk control. Project-based assessments will verify their abilities in process design, data insight, and performance evaluation.Core Vocational Qualities: Communication, project management, legal compliance, and professional

ethics should be woven into every course. Activities such as simulated business negotiations, team competitions, and enterprise internships will sharpen market awareness and resilience under pressure.Innovation & Entrepreneurship: Learners should be encouraged to apply emerging technologies—AI recommendation engines, livestream commerce tools, cross-border platform integrations — in small-scale startup experiments. Campus incubators can support iterative prototyping to cultivate market sense and risk management skills.

Additionally, a digital teaching ecosystem and faculty development framework must be established. By leveraging cloud computing, big data, and the IoT, institutions can build "smart" classrooms, virtual simulation labs, and intelligent assessment systems that offer personalized learning paths and instant feedback. Integrating Open Educational Resources (OER) and industry-leading MOOCs will connect students to broader, even international, learning communities. For instructors, regular industry secondments, shared case libraries, expert seminars, and professional workshops will keep teaching staff at the forefront of e-commerce practice. Finally, a multidimensional evaluation system — combining formative assessment, project portfolios, enterprise mentor reviews, and learning analytics — will close the loop between teaching, practice, feedback, and continuous improvement. Through this philosophical and objective overhaul, vocational e-commerce programs can evolve into truly industry-integrated, competency-driven talent pipelines.

3.2 Optimizing Course Content and Structure

Building on the revised philosophy and goals, the curriculum should be overhauled along a three-tier "Core – Expansion – Application" framework. Core courses will cover foundational topics—platform operations, digital marketing principles, and data analytics — laying out a coherent end-to-end understanding. Expansion modules will introduce cutting-edge areas such as social commerce, livestream marketing, cross-border compliance, and big data visualization. Application courses will be organized around a "Competition – Live Project – Incubation" sequence, using real company cases and entrepreneurial exercises to train students in solving multifaceted business challenges.Next, each course unit must shift from pure lecturing to task-driven learning. By embedding case studies, hands-on projects, and team assignments—on themes like short-form video campaigns or cross-border logistics design — students engage in cross-module collaboration. Assessment rubrics will align knowledge points, skill competencies, and job readiness, incorporating industry certifications (e.g., Alibaba OCP, Google Analytics) where appropriate.Further, on- and off-campus practice must form a seamless whole. On campus, an intelligent simulation center, cloud-based e-commerce platform, and data labs will replace one-dimensional drills with "sandbox exercises + livestream simulations + real-time analytics," continuously updated in partnership with enterprises. Off campus, "credit-based workshops" co-run with industry firms will implement block-release, project-based teaching, with enterprise mentors

guiding and evaluating students in authentic operational settings.Digital resources and open learning platforms should be fully leveraged. Integrating MOOCs, SPOCs, micro-lectures, and OER, the school can launch micro-credential tracks that students select according to their interests and career goals. Adaptive learning recommendations and intelligent diagnostics will personalize study plans. A shared resource repository — built jointly with peer institutions and industry bodies —will host question banks, case collections, and simulation scripts, maximizing high-quality resource reuse.Finally, a dynamic adjustment and quality assurance mechanism is essential. An industry–education advisory board, composed of experts, corporate representatives, and alumni, will periodically review and update curricula. Quarterly or annual dialogues and learning outcome analyses — covering graduate employment rates, employer satisfaction, and student progression data — will feed into a "needs–design–implementation–evaluation–feedback" cycle, ensuring the e-commerce program remains responsive, robust, and impactful.

4 Teaching Reform Practices and Pathways

4.1 Project-Driven Learning and Industry–Education Integration

To translate teaching philosophy and objectives into concrete practice, vocational colleges should center their approach on project-driven learning and achieve a seamless "classroom–training–enterprise" triad through deep industry–education integration. First, design teaching projects around real industry pain points and enterprise needs. Colleges can partner with leading e-commerce companies or regional platform operators to select representative business scenarios—such as short-form video marketing campaigns, cross-border logistics optimization, or livestream operations paired with data analysis — and jointly develop project briefs and assessment criteria. Working in small teams, students take responsibility for the entire workflow — market research, solution design, platform setup, operational execution, and performance evaluation—while learning to make data-driven decisions, collaborate effectively, and manage risk.

In implementation, adopt a dual-mentorship model. Academic mentors (full-time faculty) manage theory instruction and monitor learning progress, while enterprise mentors (practicing professionals) provide business resources, real operational data, and on-the-job insights. By leveraging the college's digital teaching platform and the company's cloud systems, students gain 24/7 access to live dashboards — traffic, conversion metrics, user profiles—and experience firsthand the shifts in roles and responsibilities inherent in e-commerce operations. Enterprise mentors join mid-term reviews and final project defenses, offering actionable feedback that drives students' work toward real-world viability.

Industry–education integration should extend beyond individual projects into the curriculum and training infrastructure. Colleges can co-establish off-campus training centers or "e-commerce integration labs" with partner enterprises, continuously synchronizing simulation platform features and business workflows to "port enterprise systems onto

campus.” Jointly developing syllabi, case libraries, and assessment rubrics breaks down resource silos between school and industry. Outstanding student projects can feed into enterprise pilot programs, creating a virtuous cycle of academia–industry–research collaboration. This approach not only heightens teaching effectiveness and delivers “job-ready” graduates, but also generates ongoing data and insights to inform future curriculum improvements.

4.2 Building Digital Teaching Resources and Platforms

Creating a digitally enabled teaching ecosystem that aligns with industry practice is essential for sustaining project-driven, integrated learning. First, develop a unified smart-education platform that combines a Learning Management System (LMS), virtual simulation labs, and a cloud-based e-commerce sandbox. The LMS should handle resource distribution, progress tracking, and online assessments. Virtual labs — leveraging real e-commerce platform APIs — must simulate product management, order fulfillment, and marketing analytics so students can practice anytime, anywhere. A cloud-based sandbox supplied by partner companies provides initial datasets and live back-end access for tasks like livestream selling and cross-border payment integration, completing the “sandbox-to-live” learning cycle.Next, assemble a rich, multi-modal resource repository to digitize the full “learn–practice–test–evaluate” sequence. This library should include micro-lectures, flipped-classroom videos, case studies, code examples, and datasets; assessment banks aligned with industry certifications; and vaults for student project artifacts with enterprise feedback. By integrating Open Educational Resources (OER) and establishing inter-school sharing mechanisms, high-quality courses, cases, and simulation scripts can flow across institutions, boosting resource utilization and driving pedagogical innovation.Then, introduce intelligent learning analytics and personalized tutoring. Using big data and AI, visualize student engagement patterns, grade distributions, and project milestones to generate real-time learning reports. These insights enable instructors to offer tailored interventions, while the platform can automatically recommend remedial materials and targeted exercises to help learners close knowledge gaps.Finally, ensure platform security and sustainable operations. Work with campus IT and corporate technology teams to define unified access controls, audit trails, and backup protocols that guarantee stability and reliability. Regularly convene workshops for faculty and enterprise mentors on new features and content updates, establishing a “platform–content–operations” synergy that keeps digital teaching environments dynamic and future-proof.

5 Reform Outcome Evaluation and Continuous Improvement

5.1 Teaching Quality and Student Competency Assessment

To holistically measure reform impact, employ a “comparative analysis + multidimensional evaluation” framework focusing on theory mastery, practical skills, project completion, innovation, and workplace readiness. Comparing the 2023 cohort (pre-reform) with the 2024 cohort (post-reform) yields:

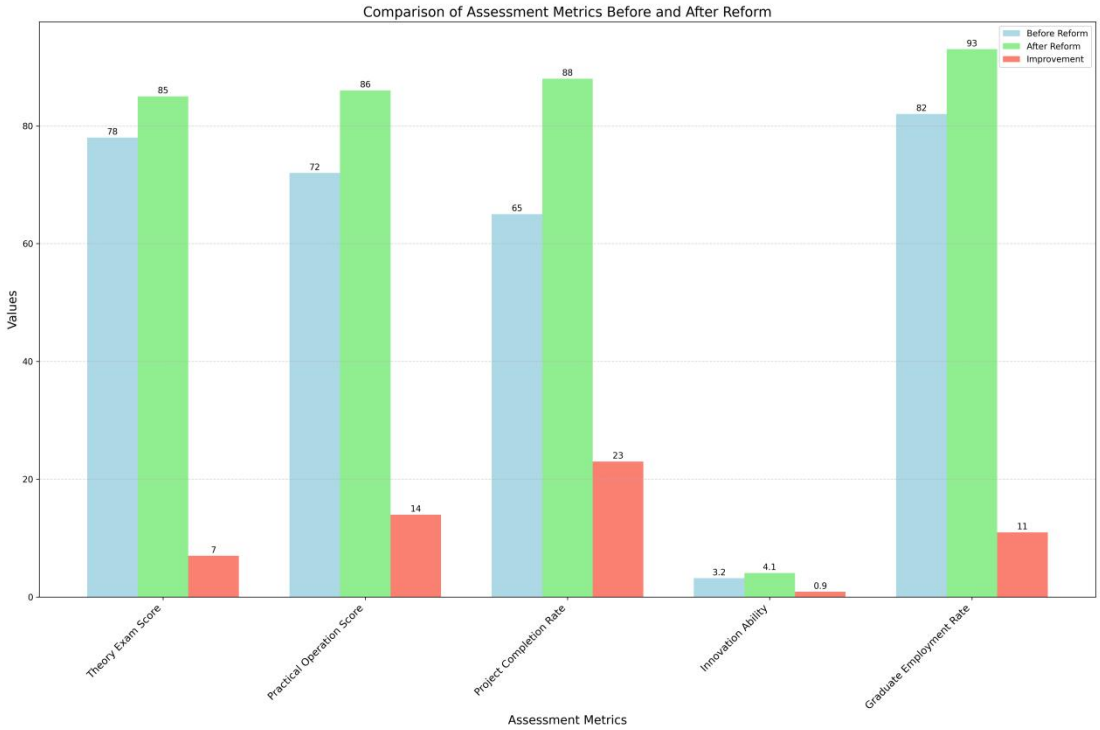

Figure 2: Comparison of student data

These figures demonstrate marked gains in both theoretical understanding and hands-on capability—especially a 14-point jump in practical scores—indicating the effectiveness of project-driven, school–enterprise collaboration. Higher project completion and innovation ratings show stronger cross-module integration and creative thinking. The rise in employment rates further confirms alignment with industry needs. Moving forward, ongoing surveys of student satisfaction, mentor feedback, and alumni tracking will enrich these metrics, creating a data-driven, continuous-improvement loop.

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5.2 Feedback and Improvement Recommendations

Surveys and interviews with students, faculty, and enterprise mentors highlight key issues: incomplete simulation features, limited mentor engagement time, and lagging curriculum updates, alongside a need for more diversified assessment. Recommended actions span platform enhancement, deeper industry collaboration, and curriculum renewal:

Table 1: Existing Problems and Improvement Suggestions

Feedback Area	Avg. Rating (out of 5)	Key Issue	Recommended Improvement
Simulation Feature Coverage	3.7	Missing livestream-commerce module	Integrate livestream selling and cross-border payment features, and update scenario scripts regularly
Enterprise Mentor Engagement	4.0	Insufficient on-campus mentorship duration	Formalize mentor residency agreements,

			requiring at least four weeks per semester and involvement in course design
Curriculum Update Timeliness	3.5	Slow incorporation of emerging topics	Establish a quarterly curriculum review by the Industry–Education Advisory Board, with formal update protocols
Multidimensional Assessment	3.8	Lack of formative and enterprise-based evaluation	Increase weight on process assessments and project portfolios, and include enterprise mentor scoring and feedback

These measures will be monitored through regular indicator tracking, supplemented by annual employment and employer satisfaction surveys, to sustain the “feedback–optimization–re-feedback” cycle and ensure ongoing reform success.

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Conclusion

This paper has outlined a systematic path for reforming e-commerce education in higher vocational colleges under the “Internet Plus” era, focusing on four dimensions: pedagogical philosophy reconstruction, curriculum optimization, project-driven industry–education integration, and informatized platform construction. Empirical results reveal that average theory exam scores rose by seven points, practical training scores increased by fourteen points, project completion rates jumped from 65% to 88%, and graduate employment rates climbed from 82% to 93%, all of which demonstrate a significant boost in students’ hands-on abilities and innovative capacities. The reform has not only achieved a seamless alignment between school and enterprise but also provided a real-world platform for students to practice decision-making and collaboration in authentic e-commerce scenarios. Moving forward, efforts should concentrate on continually enhancing the simulation training system, deepening enterprise mentors’ engagement, and establishing a dynamic curriculum update mechanism. These measures will ensure that teaching reforms evolve iteratively, laying a lasting foundation for cultivating high-quality, application-oriented e-commerce professionals.

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