

# Research on the Integration Model of Career Education for E-commerce Major in Higher Vocational Colleges and Industrial Demand under Digital Transformation

Ying Song

Wuhan City Polytechnic Wuhan, China

**Abstract:** E-commerce job competency standards has undergone dramatic shifts amid widespread digital upgrading. Vocational e-commerce programs currently suffer from three typical drawbacks in career training. They fail to match real industrial needs, lack mature integration mechanisms, and respond sluggishly to localized industrial iteration. This paper adopts industrial demand as its core orientation and constructs a three-dimensional transmission framework covering industrial demand acquisition, educational transformation and individual growth. Empirical analysis is conducted targeting Hubei's featured e-commerce sectors, including cross-border trade, live-streaming sales and rural commercial services. The structured framework built in this research can well link ever-changing industrial requirements with curriculum design and talent cultivation goals. Regional adaptation algorithms adopted in the research deliver measurable data support for flexible and differentiated curriculum setting. Different from conventional single-dimensional skill training modes, the optimized solution centered on "3+X" modular courses and blockchain-supported competency archives provides practical and referable reform ideas. It helps local vocational e-commerce education step out of homogenized training and gradually build a smarter, digitally empowered career cultivation system.

**Keywords:** Digital Transformation; Higher Vocational E-Commerce Major; Career Education; Industrial Demand; Three-Dimensional Conduction Model; Integration of Industry and Education

## 1. Introduction

Higher vocational institutions undertake the primary task of cultivating practical and technical talents for the e-commerce industry. Professional

operational skills are delivered throughout the teaching process, while career education is embedded in every stage of talent training. This integrated teaching approach helps students build clear professional awareness and develop flexible competencies for job selection and career adaptation [1]. Vocational colleges have gradually optimized their career planning systems for students under the guidance of targeted employment policies. Employment-related tutoring has also been advanced to connect closely with daily teaching and training procedures.

The continuous advancement of the digital economy has accelerated the digital upgrading of the e-commerce industry. A wealth of new job roles have emerged in this process, covering live streaming operation, cross-border store management, and e-commerce data marketing. Professionals with relevant capabilities are currently in short supply in Hubei's digital commerce market. The digital transformation of higher education still faces prominent practical obstacles. Rigid talent training models, outdated curriculum systems, and inadequate educational governance are the main restrictive factors that hinder high-quality educational development [2]. Driven by booming artificial intelligence technologies, core courses for vocational e-commerce majors, including visual marketing and live streaming operation, are updated at an unprecedented speed. Traditional professional training frameworks can no longer match industrial technological changes, which requires educators to reshape talent training objectives and professional positioning [3]. Rapid iteration of industrial posts has widened the gap between educational supply and market demand. It has become a core reform task for vocational e-commerce majors to realize effective docking between student career education and real industrial demands.

Theories of career education emphasize that the cultivation of employability for vocational

students must follow the continuous laws of individual career development and adopt systematic training methods [4]. The formation of students' high-quality employment competitiveness relies on organic coordination between national strategic deployment and personal career development planning [5]. Existing academic findings have laid a basic theoretical foundation for vocational career education research. Most previous studies, however, merely stay at the conceptual discussion level. Few of them combine regional industrial big data to design operable and practical education models, which greatly limits the practical value of relevant research. To fill this research gap, this study takes industrial demand as the core driving factor and constructs a three-dimensional conduction model. Based on field investigations and educational pilot practices in Hubei Province, this paper explores feasible integration strategies between career education and industrial needs for vocational e-commerce majors. The research outcomes aim to alleviate the structural imbalance between talent training supply and industrial employment demand in the local e-commerce industry.

## 2. Core Concepts and the Theoretical Framework of the Three-Dimensional Transmission Model

### 2.1 Definition of Core Concepts

**Digital Transformation.** Digital tools such as big data, blockchain and short-video platforms have reshaped e-commerce job competencies. Modern industry roles no longer merely require basic business skills, but also prioritize digital capabilities including data analysis, content creation and cross-platform operation. Such evolving job standards push vocational e-commerce education to renovate its original talent training systems to adapt to industrial changes.

**Industry-Driven Approach.** Local e-commerce enterprises' competency criteria serve as the core basis for vocational talent training. With data mining and professional evaluation from enterprise practitioners, specific job requirements are converted into targeted curriculum objectives, teaching tasks and assessment benchmarks. This approach shifts vocational talent cultivation away from school-centered experience and toward practical industrial demands.

**Integration of Career Education.** Colleges can integrate core literacy regarding vocational

cognition, career decision-making and adaptive awareness into professional coursework, practical training and academic evaluation. This embedded teaching mode effectively unifies technical skill training and long-term career development guidance for e-commerce majors.

### 2.2 Construction of a Three-Dimensional Transmission Model Driven by Industry Demand

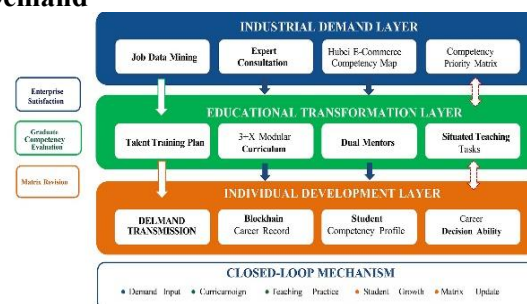


**Figure 1. A Three-Dimensional Transmission Model for Career Education in E-Commerce at Higher Vocational Colleges Driven by Industry Demand**

This research abandons the outdated dual-structured industry-education integration mode and builds a closed-loop three-dimensional model covering industrial demand, educational transformation and individual growth (see Figure 1). The model takes regional e-commerce job demands as its core logic. By analyzing local recruitment data of live-streaming, cross-border and rural e-commerce in Hubei and adopting expert verification, this study develops a targeted post competency map and capability priority matrix that reflect real market requirements. As a vital transitional module, the education transformation layer effectively translates industrial competency standards into actionable teaching contents, including tailored talent training plans, adaptive “3+X” modular courses, practical training programs and multi-dimensional evaluation systems. Relying on blockchain-based digital career growth portfolios (competency profiles), it records students' learning and practical experience, generates individual job competency profiles, and provides talent competency information to enterprises. These three layers form a closed loop: industry demand is continuously updated and fed into the Educational Transformation Layer; educational reforms influence individual student development; and graduate employment feedback and enterprise satisfaction evaluations flow back to the Industry Demand Layer, continuously

refining the job competency matrix to achieve dynamic iteration.

### 3. Practical Challenges in E-Commerce Career Education at Higher Vocational Colleges in Hubei Amid Digital Transformation

This study collected 10,000 e-commerce job postings from Hubei, used the TF-IDF algorithm to extract high-frequency competency indicators, and selected three pilot higher vocational colleges in the province to conduct classroom observations, interviews with faculty and students, and a questionnaire survey of enterprises. Table 1 presents the statistical results of high-frequency competency requirements for e-commerce positions in Hubei.

**Table 1. Statistics on Frequently Requested Skills for E-Commerce Positions in Hubei**

| Competency Category      | High-Frequency Competency Items                                                       | Business Format Distribution                                                                  | Demand Level |
|--------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------|
| Professional Skills      | Store operations, order processing, supply chain management                           | All business formats                                                                          | High         |
| Technical Skills         | Short video editing, live-stream control, e-commerce data analysis                    | Live-stream e-commerce, cross-border e-commerce                                               | Very high    |
| Regional Characteristics | Auto parts copywriting, cultural tourism product selection, minor-language operations | Xiangyang auto e-commerce, Yichang cultural tourism e-commerce, Wuhan cross-border e-commerce | Medium       |
| Professional Literacy    | Job role awareness, stress resistance, career transferability                         | All business formats                                                                          | Medium       |

Note: Demand popularity is determined by combining TF-IDF text mining results with expert ratings on a five-point Likert scale. The sample consists of 10,000 job postings for e-commerce positions from a Hubei-based recruitment platform.

#### 3.1 Lack of a Mechanism Linking Industry Demand to Talent Development, Resulting in a Mismatch in Skills

Against the backdrop of digital transformation, a large number of new e-commerce business models have emerged in Hubei, and companies generally place a high value on comprehensive digital competencies such as data analysis, short-video and live-streaming operations, and cross-border multilingual operations. As shown in Table 1, digital technology skills and regionally specific competencies have become key requirements in corporate recruitment. Research on the alignment between graduate employment

and industrial demand in other provinces similarly indicates a structural mismatch between regional industrial needs and the talent cultivated by higher education institutions, highlighting an urgent need to establish a dynamic alignment mechanism [6]. The survey found that some higher vocational colleges in Hubei have long curriculum update cycles and still place too much emphasis on traditional e-commerce theory instruction.

#### 3.2 Current Vocational Teaching Isolates Career Cultivation from Major Courses, and Integration Remains Superficial

Most vocational colleges offer independent career courses that operate separately from core e-commerce subjects such as “Live Streaming Operation”, “Cross-border E-commerce” and “Visual Marketing Design”. Professional course teachers seldom participate in career guidance, and classroom teaching rarely incorporates authentic vocational scenarios. Relevant studies on vocational e-commerce education have confirmed the widespread “two separate systems” issue between professional teaching and career training [7]. Students fail to connect professional knowledge with specific job duties and career pathways. Meanwhile, generic career courses lack industry-specific practical content, resulting in disjointed learning outcomes that cannot effectively strengthen students’ independent career judgment.

#### 3.3 Insufficient Response to Regional Industrial Differences and Lack of a Dynamic Adjustment Mechanism

E-commerce development varies greatly across Hubei’s regions. Wuhan prioritizes cross-border trade, Xiangyang develops auto-parts e-commerce based on local manufacturing advantages, and Yichang focuses on cultural and tourism commerce supported by local cultural resources. Even so, most local vocational programs adopt unified curricula without adjusting course focus to match regional industrial features. Schools also lack stable channels to update industrial data, with talent training schemes revised only at long intervals. Such rigid updates cannot keep up with the fast iteration of digital commerce roles.

### 4. Practical Strategies of Industry-Driven Career Education Integration in Hubei

Based on the established three-dimensional

transmission model and practical experience from pilot vocational colleges in Hubei, this study constructs a targeted integration framework for e-commerce career education. The framework covers four key operational dimensions: industrial demand identification, curriculum reform, implementation mechanism, and assessment feedback, which systematically aligns vocational training with evolving industrial needs.

#### 4.1 Multi-channel Collection of Regional Industrial Data and Construction of Hubei E-commerce Competency Spectrum

To realize the practical value of the industrial demand layer, this study adopts a dual acquisition framework combining big data mining and enterprise expert evaluation to identify real competency requirements of local e-commerce posts. It sorts and screens massive recruitment text data to extract core skill indicators and form regional competency heat maps. With three rounds of interviews with local enterprise executives and HR practitioners, together with open questionnaires, Likert scale scoring and weight assignment, a three-level priority matrix of digital competencies for Hubei e-commerce industry is established. Based on existing industry-oriented training reforms [8] and localized career education practices [9], this study adjusts competency training weights according to the distinct e-commerce features of Wuhan, Xiangyang and Yichang, providing solid quantitative support for targeted regional curriculum optimization.

#### 4.2 Building a “3+X” Modular Curriculum System for Career Education Based on a Three-Dimensional Transmission Model

This study gives full play to the intermediary function of the educational transformation layer and restructures the “3+X” modular curriculum system (see Table 2) to deeply integrate career education into professional teaching. Modular teaching has been widely applied in career education practice [10]. Referring to the EU DigComp digital competency framework, this study decomposes general digital literacy goals into measurable and achievable learning outcomes in the design of digital skill modules [11]. As shown in Table 2, the core “3” consists of three compulsory modules. The professional foundation module consolidates students’ basic e-commerce expertise. The digital skill module

cultivates practical capabilities such as live-streaming operation and data analysis. The professional literacy module integrates post cognition, professional ethics and career decision-making into mainstream courses. In core subjects including Live Streaming Operation and Cross-border E-commerce, scenario-based tasks such as job simulation and practitioner interviews are arranged to integrate professional knowledge instruction with career competency cultivation. “X” represents the dynamic elective module, which is updated quarterly based on the industry competency popularity index. It offers micro-courses such as “Automotive E-commerce Copywriting” and “Cross-Border Short Video Operations,” tailored to the distinctive characteristics of Hubei’s local industries.

**Table 2. “3+X” Career-Integrated Modular Curriculum Framework for E-Commerce Programs in Higher Vocational Education**

| Module                         | Course Content                                                                                                        | Course Percentage                         | Career Education Integration Design                                                                |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------|
| Professional Foundation Module | E-commerce fundamentals, online marketing, etc.                                                                       | 60% (split among the three major modules) | Integrate industry development trends and job type awareness                                       |
| Digital Skills Module          | Live-streaming operations, cross-border e-commerce, data analysis, visual marketing design                            | Same as above                             | Set up job simulation exercises and enterprise job case teaching                                   |
| Professional Literacy Module   | Professional ethics, career decision-making, workplace communication                                                  | Same as above                             | Embed career scenario tasks and professional interviews in professional courses                    |
| Industry Trends Micro-lessons  | Cross-border short videos, auto e-commerce copywriting, cultural tourism community e-commerce product selection, etc. | 40%                                       | Dynamically updated based on industry competency demand levels, matching regional business formats |

#### 4.3 Establishing an Implementation Mechanism for the “Dual Circulation” of Industry-Education Collaboration to Empower Individual Development

Establish a dual-circulation mechanism for industry-education collaboration that coordinates internal and external circulation (see Figure 2). As shown in Figure 2, the internal cycle is the teaching-side cycle: industry experts participate in setting course objectives; course modules are updated quarterly based on the demand for job-specific competencies; scenario-based teaching is implemented in pilot classes; student job competency radar charts are generated regularly; and teaching content is continuously optimized.

The external cycle is the supply-and-demand matching cycle: a blockchain-based digital career growth portfolio (competency profile) is established to comprehensively record students' project-based training and skill attainment. The application of blockchain-based micro-certificate systems in higher education has been validated, enabling the trustworthy recording of learning outcomes and cross-institutional mutual recognition [12]. Enterprises can use competency profiles to quickly screen for suitable talent; when their competency evaluations of interns and graduates are fed back to the school, this information is used to refine the job competency matrix and curriculum design, thereby breaking down information barriers between schools and enterprises regarding talent.

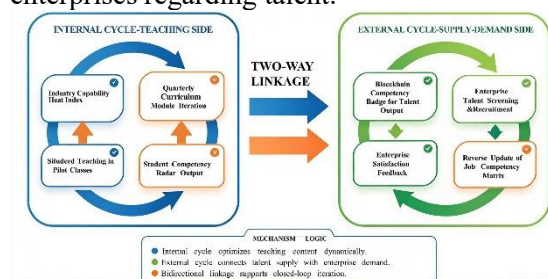


**Figure 2. Schematic Diagram of the Implementation Mechanism for the “Dual Circulation” Model in Industry-Education Collaboration**

#### 4.4 Establish a Regional Suitability Assessment and Refine a Diverse Evaluation System

Move away from a single-exam evaluation method and establish a comprehensive evaluation system that takes into account professional skills, career competencies, and job suitability. In terms of teaching methods, draw on narrative pedagogy to enhance students' professional identity and career decision-making abilities through situational tasks such as interviews with industry professionals and sharing of workplace stories [13]; introduce reflective teaching methods to guide students in conducting self-reviews and reflecting on their career positioning after practical training [14]; and simultaneously leverage blended online and offline teaching to expand the temporal and spatial boundaries of career education resource provision [15]. In terms of evaluation dimensions, on the one hand, we assess the extent to which the curriculum system aligns with the e-commerce industries across various regions of Hubei; on the other hand, we collect pilot data from two key dimensions:

students' career decision-making abilities and employers' satisfaction with graduates. For example, pilot institutions in Xiangyang have moderately increased the weighting of teaching modules related to automotive e-commerce, while those in Yichang have added practical training for cultural and tourism e-commerce projects, exploring dynamic matching rules that combine “regional industrial characteristics” with “curriculum weighting.”

#### 5. Research Conclusions and Outlook

Against the backdrop of digital transformation, vocational e-commerce education should no longer rely merely on conventional career courses, but fully align with real industrial demands. Based on empirical research in Hubei, this study constructs a three-dimensional transmission model covering industrial demand, educational transformation and individual development. By establishing competency spectrum, restructuring the “3+X” modular curriculum and building a sustainable industry-education circulation mechanism, the research forms a complete training chain connecting industrial posts and students' career growth. It effectively resolves the common problems of isolated career education and outdated talent training that fails to keep pace with regional digital industrial upgrading.

Practical results from pilot colleges in Hubei verify that taking industrial data as the core training basis and embedding career literacy into professional teaching can significantly improve students' post recognition and career decision-making ability, as well as enhance the matching degree between graduates and local e-commerce jobs. The proposed model can provide practical references for career education reform in similar vocational business colleges nationwide.

#### Acknowledgments

This paper is supported by WHCP and the Hubei Provincial Vocational Education Association. (Project: Integration of Vocational E-commerce Education and Industry Needs in the Context of Digital Transformation; Project No.HBSYB2518).

#### References

- [1] Sun Yajuan. “Building a Career Planning Education System for Higher Vocational College Students in the Context of Targeted Employment”. Hebei Vocational Education,

- 2025, 9(01).
- [2] Huang Ronghuai, Liu Jiahao, Qi Binbin. "Practical Challenges and Core Concerns in the Digital Transformation of Higher Education". Chinese Higher Education, 2024(Z1).
  - [3] Wang Yu, Gu Zuo. Iteration and Reshaping: The Positioning and Objectives of Visual Design Education in the AI Era. Journal of Shandong University of Art & Design, 2024(04).
  - [4] Chen Hangqi. Developing Employment Competencies among Vocational College Students from the Perspective of Career Development Theory. Teaching and Nurturing (Higher Education Forum), 2025, (03): 56–59.
  - [5] Shi Qiuhe, Sun Xinyan, Jin Linghong. The Logical Framework and Strategic Orientation for the Development of High-Quality Employment Competencies among College Students. Research on Educational Development, 2024(07).
  - [6] Wei Yan'e. A Study on the Alignment of Graduate Employment and Industrial Demand in Fujian Province. Future and Development, 2024(09).
  - [7] Huang Yan, Zhou Chuan'ai. "A Study on the Application of 'Micro-Carriers' in Career Planning Education for E-commerce Majors in Higher Vocational Colleges". Vocational and Technical Education, 2024, 23(12).
  - [8] Wang Qinglan, Liu Qi, Xu Li. "Reform and Practice of Talent Cultivation Models for Optoelectronics Majors Guided by Industrial Demand". Industrial Innovation Research, 2024(04).
  - [9] Fu Na. Exploring Career Education Practices in Higher Vocational Education from a Localization Perspective. Science, Education, and Guidance, 2024, (34).
  - [10] He Zhengquan. Concepts and Practices of Blended Online-Offline Modular Teaching in Career Education Courses. Science, Education, and Culture, 2024(08).
  - [11] Koliskina, Valentina, and Andrei Kolyshkin. "Development of Students' Digital Skills in Accordance With Digcomp Framework". ICERI2024 Proceedings 1(2024):3702-3710.
  - [12] Alsobhi, Hada A. et al. "Blockchain-based Micro-Credentialing System in Higher Education Institutions: Systematic Literature Review". Knowledge-Based Systems, 265(2023):110238.
  - [13] Brady, Destiny R., and Marilyn E. Asselin. "Exploring Outcomes and Evaluation in Narrative Pedagogy: an Integrative Review". Nurse Education Today, 45(2016):1-8.
  - [14] Jakeman, Rick C. et al. "Reflective Pedagogy: the Integration of Methodology and Subject-Matter Content in a Graduate-Level Course". Teaching in Higher Education, 22.2(2017):207-221.
  - [15] Li, Yi, and Jun Wu. "Exploration of Teaching Reform Practice of the Course 'Sales Promotion and Business Negotiation' Based on Hybrid Teaching". Journal of Education and Educational Research, 9.2(2024):136-141.