

Research on the Paths and Practices of Cross-Border E-Commerce Empowering College Students' Employment and Entrepreneurship under the Background of Intelligent Economy

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Abstract: As an advanced evolved form of the digital economy, the intelligent economy has become a core new engine of global economic growth. As the core carrier of digital trade, cross-border e-commerce not only drives the transformation and upgrading of China's foreign trade, but also continuously expands employment and entrepreneurship channels for college graduates. Based on authoritative statistical data of the cross-border e-commerce industry, this paper sorts out the current situation of industrial scale expansion and structural mismatch between talent supply and demand, and analyzes the internal transmission paths through which cross-border e-commerce empowers college students' employment and entrepreneurship. The study finds that the traditional university talent training system is currently plagued by prominent practical pain points, including lagging curriculum iteration, superficial integration of industry and education, insufficient practical capabilities of teachers, and inadequate supporting facilities for entrepreneurship incubation. From the collaborative perspective of industry and education, this paper puts forward four optimization paths: establishing a long-term industry-education integration mechanism, reconstructing project-based curricula, building a teaching team with dual-qualified capabilities, and constructing a whole-chain entrepreneurship incubation ecosystem. Taking the cross-border e-commerce practical studio and the "AI + Practical Training" education model of Qingdao Huanghai University as practical cases for verification, this paper provides theoretical references and replicable practical schemes for the reform of university innovation and entrepreneurship education and the alleviation of youth employment pressure in the era of intelligent economy.

Keywords: Intelligent Economy; Cross-Border E-Commerce; College Students; Employment and Entrepreneurship; Industry-Education Integration

1. Introduction

At present, the in-depth integration of intelligent economy, digital economy and artificial intelligence has reshaped the pattern of global economic and trade division of labor. Relying on the advantages of low cost, cross-regional coverage and wide market reach, cross-border e-commerce has become the most dynamic new foreign trade format within the intelligent economic system, playing a key supporting role in stabilizing foreign trade, expanding employment and boosting entrepreneurship [1]. Meanwhile, the number of college graduates in China has remained at a high level for consecutive years. The scale of national college graduates reached 12.22 million in 2025 and is expected to rise to 12.7 million in 2026. The employment absorption capacity of traditional industries tends to be saturated, and structural employment contradictions keep prominent. Expanding market-oriented employment channels for young people through the new format of cross-border e-commerce and improving the university innovation and entrepreneurship education system have become core measures to implement the dual national strategies of building an intelligent power and a trade power.

There exists a prominent imbalance between industrial talent supply and demand. Industrial surveys show that the national talent gap in cross-border e-commerce has reached 4 million. The essence of the supply-demand contradiction lies not in the total shortage of talents, but in the capability mismatch between industrial practical demands and university talent output [2]. China has issued a series of policies to support the

development of cross-border e-commerce and youth entrepreneurship and employment. The 14th Five-Year Plan for E-commerce Development clearly proposes to expand employment capacity in the e-commerce sector and cultivate compound cross-border e-commerce talents [3]. By the end of 2025, the number of national comprehensive cross-border e-commerce pilot zones had expanded to 178, covering all 31 provincial-level administrative regions nationwide, with industrial clusters, overseas warehouses and supporting service systems gradually improved [4].

Existing relevant studies mostly focus on a single dimension such as curriculum reform, practical training base construction or school-enterprise cooperation. Few adopt an integrated macro analytical framework covering national strategies, industrial data and university practical implementation, and in-depth research on the underlying mechanism and long-term education paths of cross-border e-commerce empowering employment and entrepreneurship is insufficient. Based on the latest statistical data released by the General Administration of Customs and the Ministry of Commerce, this paper embeds the employment and entrepreneurship of cross-border e-commerce into the strategic framework of the dual circulation and intelligent economic development. It systematically decomposes the empowerment mechanism and weaknesses in talent cultivation, and constructs a long-term government-university-enterprise collaborative education system combined with real practical cases of local application-oriented universities, so as to provide decision-making support for local universities, competent industrial authorities and cross-border platform enterprises.

2. Development Trend of Cross-Border E-Commerce Industry and Characteristics of Talent Demand

2.1 Sustained Industrial Scale Growth and Continuous Release of Policy Dividends

China's cross-border e-commerce industry maintains steady growth momentum. Official statistics from the General Administration of Customs show that the total import and export volume of cross-border e-commerce nationwide reached 2.75 trillion yuan in 2025, an increase of 69.7% compared with 2020, including exports of 2.25 trillion yuan and imports of 0.5 trillion yuan.

The import and export volume of cross-border e-commerce hit 1.37 trillion yuan in the first half of 2025, a year-on-year increase of 10.3%, 7.4 percentage points higher than the overall foreign trade growth rate, accounting for 6.3% of China's total goods trade volume. The import and export scale reached 618.46 billion yuan in the first quarter of 2026, with exports of 473.55 billion yuan, a year-on-year rise of 8.2%.

In terms of policies, cross-border e-commerce has been included in government work reports every year since 2013. In 2025, the State Council approved the establishment of new comprehensive pilot zones in the whole Hainan Island and 15 cities including Qinhuangdao, bringing the total number of national pilot zones to 178. The 2026 Government Work Report proposed to promote the standardized expansion and upgrading of the "cross-border e-commerce + overseas warehouse" model. In the same year, six departments including the Ministry of Commerce jointly issued guidelines for the high-quality development of e-commerce, focusing on expanding the "Silk Road E-commerce" initiative and advancing institutional opening-up of digital trade.

Regional industrial agglomeration has taken shape nationwide. Cities including Shenzhen, Guangzhou, Ningbo and Qingdao have built complete industrial chains integrating platforms, sellers and supporting service providers. Benefiting from the dual policy dividends of the SCO Demonstration Zone and Pilot Free Trade Zone, Qingdao's cross-border e-commerce import and export volume exceeded 90 billion yuan in 2025, with 114 overseas warehouses deployed, more than 2,500 registered cross-border enterprises and 27,000 online stores, laying an industrial foundation for regional universities to carry out industry-education integration and targeted talent cultivation.

2.2 Expanding Talent Gap and Prominent Capability Mismatch

Data from the 2025 White Paper on Cross-border E-commerce Talent Cultivation indicates that the national supply gap of cross-border e-commerce talents reached 4 million in 2025 and keeps expanding year by year. Operation posts account for 70.35% of total job demands, followed by product development and cross-border customer service posts. The gap for high-end technical talents stands at 51.16%, while the gap for high-level

management talents reaches 50% [5].

The core industrial contradiction lies in capability mismatch rather than total quantity shortage. Surveys in the 2025 Report on Vocational Talent Cultivation in Cross-border E-commerce reflect that enterprises generally complain that fresh graduates lack practical operation capabilities, have insufficient understanding of platform rules and fail to meet market demands in business foreign language application. A survey of 50 leading cross-border enterprises in Ningbo confirms three layers of talent imbalance contradictions: the contradiction between demand for compound posts and supply of single-skill talents, the contradiction between rapid industrial technological iteration and lagging curriculum content, and the contradiction between enterprises' immediate employment demand and long-cycle university cultivation.

Talent distribution presents an obvious Matthew effect: Guangdong accounts for 22.04% of national talent demand and Zhejiang accounts for 11.99%. 82% of mature cross-border e-commerce talents are concentrated in eastern coastal regions, while the supply of e-commerce talents in central and western regions as well as counties and towns is severely insufficient, restricting the balanced development of regional foreign trade and employment [6].

2.3 New Strategic Mission of Cross-Border E-Commerce Talent Cultivation Entrusted by Intelligent Economy

The year 2025 marked the closing year of the 14th Five-Year Plan for Digital Economy Development. The added value of China's core digital economy industries accounted for more than 10.5% of GDP, with the total industrial scale exceeding 14.7 trillion yuan. During the 15th Five-Year Plan period, China comprehensively promotes the in-depth integration of intelligent technologies and the real economy, and cross-border e-commerce has become a core supporting industry for building a trade power.

For local application-oriented undergraduate universities, cross-border e-commerce talent cultivation and innovation and entrepreneurship support are key entry points to align with the national intelligent economic strategy. Reconstructing the teaching system driven by industrial demands can cultivate a large number of compound talents equipped with foreign trade

knowledge, data analysis, AI operation and cross-border compliance capabilities. Meanwhile, relying on the low-threshold entrepreneurship attribute of cross-border e-commerce to broaden employment channels for graduates forms a two-way virtuous cycle of "industries absorbing employment and entrepreneurship feeding industries" [7].

3. Mechanism Analysis of Cross-Border E-Commerce Empowering College Students' Employment and Entrepreneurship

3.1 Full Industrial Chain Coverage and Broad Capacity to Accommodate Employment Posts

The complete industrial chain of cross-border e-commerce covers more than ten business links including product R&D, flexible supply chain, platform operation, visual design, AI data analysis, multilingual overseas marketing, cross-border logistics, cross-border payment, foreign-related compliance and customer service, with posts suitable for students majoring in e-commerce, international business, foreign languages, art design, computer science and business administration [8]. Students majoring in foreign languages can engage in overseas live streaming and cross-border customer service; design majors are responsible for store visuals and product shooting; computer majors adapt to ERP system operation and maintenance, data modeling and the development of AI operation tools.

The multi-disciplinary integrated characteristics of the industrial chain provide a natural scenario for interdisciplinary talent cultivation. The cross-border e-commerce practical studio of Qingdao Huanghai University absorbs students majoring in e-commerce, international trade and marketing to carry out practical operations in teams, realizing complementary specialties and resource sharing, which fully verifies the diversified employment carrying capacity of the industrial chain.

3.2 Low Barriers to Entrepreneurship and Controllable Trial-and-Error Costs for Student Start-Ups

Compared with traditional offline foreign trade, cross-border e-commerce features low startup capital, simplified qualification handling and diversified customer development channels. Relying on mature cross-border platforms such as Amazon, AliExpress and OZON, college

students can carry out online operations only with basic computer equipment, industrial and commercial licenses and small startup funds. Various regions have continuously issued youth entrepreneurship support policies in 2026. The Qingdao Pilot Free Trade Zone provides supporting subsidies such as one-time startup grants, interest discounts on entrepreneurial loans and premium subsidies for entrepreneurial insurance for graduate entrepreneurs meeting relevant conditions, further reducing capital pressure on startups.

The university's "integration of learning and entrepreneurship" model greatly cuts trial-and-error costs of entrepreneurship. Students can take platform operation projects as curriculum training content and conduct business under the joint guidance of on-campus tutors and industrial mentors from enterprises. The risks and time costs of entrepreneurship are far lower than those of independent social entrepreneurship, significantly improving students' entrepreneurial success rate [9].

3.3 Full-process Practical Scenarios and Systematic Cultivation of Comprehensive Professional Competence

Cross-border e-commerce operations cover the whole-link practical operations including product selection, Listing optimization, AI advertising launch, order fulfillment and cross-border after-sales service. Real-time feedback formed by real market traffic, conversion and revenue data can systematically train students' comprehensive literacy such as data research and judgment, cross-cultural communication, problem disposal and operation under pressure, and the training effect is far superior to pure simulation teaching software.

Qingdao Huanghai University has built an OZON cross-border practical project in cooperation with Qingdao Tianchuang Jinda Information Technology Co., Ltd. Within four months, 42 students uploaded more than 60,000 commodities, completed over 1,000 real orders to Russia with cumulative sales exceeding 100,000 yuan. After introducing AI intelligent operation tools in 2026, students adopt the "AI + Practical Training" model to free themselves from repetitive basic work and focus on high-level operation capabilities such as product selection strategies and brand marketing, with the speed of comprehensive professional literacy improvement significantly accelerated [10].

4. Practical Dilemmas of Traditional University Talent Training Systems

4.1 Lagging Iteration of Curriculum Systems Unable to Keep Up with Industrial Technological Updates

The iteration cycle of cross-border platform algorithms, traffic rules and international fiscal and tax policies only lasts 6 to 12 months. Represented by the evolution of Amazon's A9 algorithm to AI-driven COSMO/A10 algorithm, differentiated commission policy adjustments of TikTok Shop in multiple countries and optimization of OZON logistics rules, industrial rules keep changing continuously. However, the update cycle of textbooks and curriculum outlines in most universities generally ranges from 2 to 3 years. The teaching content in classrooms is seriously disconnected from frontline platform operations, and the product selection methods and advertising strategies learned by students on campus fail to adapt to market demands after they enter enterprises.

4.2 Superficial Industry-Education Integration Lack of Long-term Collaborative Education Mechanisms

Most school-enterprise cooperation between universities and enterprises is limited to shallow cooperation such as enterprise visits, industrial lectures and internship base listing, without establishing long-term stable collaborative mechanisms. Cooperative projects are often interrupted due to post changes of enterprise personnel or university teachers. Only a small number of universities have realized in-depth cooperation including real enterprise projects entering classrooms, simultaneous teaching by dual school-enterprise tutors and transformation of students' practical training achievements into commodities [11]. Enterprises generally feedback that fresh graduates still require 2 to 3 months of special pre-job training to independently undertake operation work after entry, highlighting prominent gaps in on-campus practical teaching.

4.3 Insufficient Frontline Practical Experience of Full-Time Teachers and Shortage of Dual-Qualified Teaching Staff

Most teachers delivering cross-border e-commerce courses directly enter universities after graduation without practical experience in

cross-border platform operation or foreign trade enterprises. Sampling survey data show that 62% of teachers specializing in cross-border e-commerce have never operated cross-border stores, and 83% of teachers are unfamiliar with mainstream industrial AI product selection and data analysis tools. The teacher structure featuring "from campus to campus" results in teaching content focusing excessively on theories, with severe insufficient capacity for practical teaching guidance.

4.4 Entrepreneurship Education Focuses on General Theories with Lack of Specialized Incubation Supporting Facilities

General public courses on innovation and entrepreneurship in universities are dominated by the Fundamentals of Entrepreneurship, with teaching content concentrated on general business plan writing and universal entrepreneurship case analysis, lacking targeted guidance on cross-border e-commerce specialized operations, supply chain docking, cross-border fiscal and tax compliance and overseas intellectual property protection [12]. After students conceive cross-border entrepreneurship ideas, they generally face obstacles such as missing supply channels, vacant operation guidance and insufficient startup funds, leading to a low survival rate of student cross-border entrepreneurship projects.

5. Optimization Paths for Cross-Border E-Commerce to Empower Student Employment and Entrepreneurship under the Intelligent Economy

5.1 Deepen Long-term Industry-Education Integration and Build a Stable School-Enterprise Collaborative Education System

Short-term visits and one-off lectures cannot support sustainable talent cultivation. Universities should link local bureaus of commerce, cross-border e-commerce industry associations and leading platform enterprises to sign long-term cooperation agreements of 3 to 5 years and build a stable collaborative education mechanism. First, jointly build cross-border e-commerce customized classes, with enterprises participating in the whole process including student recruitment screening, curriculum design, practical training assessment and employment delivery. Second, jointly build on-campus

practical studios, with enterprises continuously outputting real store accounts and supply chains and implementing annual project iteration and updates. Third, implement two-way mutual employment of teachers: industrial operation experts from enterprises conduct regular on-campus teaching, while on-campus teachers take off-job secondments in enterprises for a fixed period to avoid cooperation interruption caused by personnel changes [13].

Qingdao Huanghai University has built a cross-border e-commerce practical studio in cooperation with Qingdao Tianchuang Jinda, signing a long-term strategic cooperation agreement. The enterprise continuously provides OZON platform resources, and the university supports training venues and on-campus guiding teachers. A three-party co-management model of "student teams + enterprise tutors + full-time on-campus teachers" is adopted. Enterprise staff come to the university every week to carry out operation review and guidance, with phased practical projects set each semester, centralized practical training in winter and summer vacations and annual project iteration and updates. As of April 2026, multiple students in the studio have reached full-time employment and internship intentions with enterprises in advance.

5.2 Reconstruct Project-Driven Curriculum Systems to Match Industrial Intelligent Operation Demands Synchronously

Reconstruct the curriculum framework following the stepwise logic of "cognitive training – project practice – independent entrepreneurship": freshmen take basic cognitive courses on cross-border e-commerce to popularize basic platform rules and fundamental AI operation tools; sophomores and juniors introduce real enterprise operation projects and complete full-process practical operations under the guidance of dual tutors; seniors are encouraged to form entrepreneurial teams to undertake outsourced enterprise projects or open independent stores for entrepreneurship.

Establish a dynamic curriculum update mechanism. Invite platform operation experts and enterprise principals to review curriculum outlines every semester, synchronously integrate practical teaching contents of AI product selection tools (Jungle Scout, Helium 10), cross-border data analysis systems (Google Analytics, Seller Sprite) and cross-border ERP

systems (Dianxiaomi), ensuring teaching contents align with industrial practical standards in the intelligent economic era [14].

5.3 Improve the Echelon of Dual-Qualified Teachers and Make Up for Teachers' Shortage of Practical Capabilities

Three approaches are adopted to optimize the teacher structure: first, introduce senior operation and management talents from leading cross-border enterprises to serve as industrial professors and part-time off-campus teachers; second, arrange young and middle-aged professional teachers to take off-job secondments in cross-border enterprises for no less than 3 months, fully participating in store operation, AI marketing and supply chain management businesses; third, establish a shared mechanism of school-enterprise teachers, with enterprise tutors conducting regular on-campus teaching and on-campus teachers providing industrial research and digital transformation consulting services for enterprises to realize two-way empowerment.

Qingdao Huanghai University implements a teacher secondment mechanism in enterprises. During her secondment at the Qingdao Cross-border E-commerce Association, Dr. Xu Lijuan took the lead in compiling the Research on Industrial Development and Talent Demand Strategy of Qingdao Cross-border E-commerce, transforming industrial research data and real enterprise cases into core teaching materials for the course E-commerce Operation Management, greatly improving the practicality of the curriculum.

5.4 Build a Whole-Chain Entrepreneurship Incubation Ecosystem and Improve Supporting Entrepreneurship Policies

Construct an integrated entrepreneurship support system of "classroom teaching – project practical training – entrepreneurship incubation – market landing": first, set up micro-majors and entrepreneurship workshops specializing in cross-border e-commerce entrepreneurship to teach practical knowledge of AI operation, cross-border supply chains, international fiscal and taxation and overseas compliance in a targeted manner; second, establish a university-level cross-border entrepreneurship seed fund to provide small startup funds for high-quality student entrepreneurial teams; third, link local manufacturers and wholesale

enterprises to open up supply channels and reduce students' procurement costs; fourth, connect with local government entrepreneurship subsidies and incubation park policies to assist students in completing landing procedures such as industrial and commercial registration and application for free office space [15].

Qingdao Huanghai University invested 24.19 million yuan to build a digital economy innovation and entrepreneurship park, forming a 27,400 square-meter college student incubation base and a collaborative framework of "one site with three parks" including the University Science and Technology Park, Digital Economy Incubation Park and Film and Television Industry Incubation Park. A special incubation area for cross-border e-commerce is set up to provide free workstations for entrepreneurial teams. The park has incubated a total of 183 micro and small enterprises, with an average of 15 innovation and entrepreneurship projects launched every year. The Huanghai E-Daren Maker Space on campus is equipped with 35 full-time entrepreneurship tutors, having incubated more than 80 entrepreneurial companies and steadily cultivated 24 cross-border e-commerce entrepreneurial teams.

6. Conclusion

In the era of intelligent economy, cross-border e-commerce has upgraded from a new foreign trade growth format to a core carrier absorbing college graduates' employment and supporting youth innovation and entrepreneurship. The coexistence of sustained industrial scale expansion and structural talent mismatch brings new opportunities and practical challenges to the reform of university innovation and entrepreneurship education. Only by constructing a long-term collaborative mechanism of industry-education integration, reconstructing project-driven curriculum systems, building a practical-oriented dual-qualified teaching team and establishing a whole-chain entrepreneurship incubation ecosystem can universities resolve the pain point of "capability mismatch" in talent cultivation and transform the industrial development momentum of cross-border e-commerce into effective university education outcomes.

In the long run, with generative AI, blockchain and global intelligent overseas warehouses continuously penetrating the whole industrial chain of cross-border e-commerce, industrial

talent demands will shift from basic platform operation posts to high-end compound posts focusing on data analysis, intelligent marketing and cross-cultural brand management. Universities need to continuously track the transformation trends of intelligent economy and digital trade industries, dynamically adjust talent training programs, realize the precise matching between educational supply and national strategies of intelligent economy and trade power, and continuously deliver compound young talents for the high-quality development of China's foreign trade.

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