

A Study on the Game and Collaboration of the "Dual Mentor System" for Cross-Border E-Commerce Talent Cultivation via Industry-Education Integration and School-Enterprise Cooperation

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Abstract: As new quality productive forces drive the digital economy to continuously develop, the demand for cross-border e-commerce talents has also been rising. In the process of achieving learning tasks through school-enterprise co-construction and industry-education integration, there are profound gaps between the university education system and the enterprise market operation system due to different identities of enterprise mentors and university teachers, where the university side cares about talent quality, and the enterprise side cares about the efficiency of production. The dual mentors also encounter contradictions and inconsistencies, including unequal rights and responsibilities, differential evaluation and divergent incentives. This paper explores the games in the dual mentor system from the perspective of the five parties and their interests, analyzes the games in terms of resource input, role positioning, evaluation standards, and value orientation, and proposes a collaborative governance model based on contractual linkage, incentive compatibility and evaluation coordination for the organic linkage of the education chain and the industrial chain.

Keywords: School-Enterprise Co-Construction; Industry-Education Integration; Dual Mentor System; Game Analysis; Cooperation Mechanism; Multiple Stakeholders

1. Introduction

1.1 The Background of Research

In the background of the rapid development of the digital economy under the new quality productive forces, China's cross-border e-commerce

enterprises need comprehensive digital operation talents who "understand data, master the business chain and can make decisions". However, the cross-border e-commerce practical training at universities is in such a dilemma that textbooks and simulation systems seriously lag behind the iteration of the platform algorithms.

"Industry-education integration" has become a "policy buzzword" or even a mandatory requirement in this context. On December 19, 2017, *Several Opinions on Deepening Industry-Education Integration* were issued, which clarified the direction of connecting the education chain with the talent chain, and the industrial chain with the innovation chain [1]. The *Vocational Education Law of the People's Republic of China* which came into effect on May 1, 2022, stipulates that the state shall give full play to the important role of enterprises as school-running entities, promote the deep participation of enterprises in vocational education, and encourage enterprises to provide high-quality vocational education. Universities nationwide have launched enterprise practice platforms in their colleges to try to bring real stores, real advertising budgets, real customer complaints, and logistics anomalies into the classroom. But in the implementation process, the issue of neglected quantitative modeling has repeatedly emerged—the two evaluation logics collide in the same practical training task.

The dual mentor system is a never-ending game between university education logic and enterprise market logic, between individual value and social value, between the educational and the industrial laws. Enterprise mentors prioritize KPIs like turnover and ACOS, conversion rate, delivery timeliness, etc., while university teachers care about knowledge systems, including curriculum standards, knowledge point coverage, learning progression, academic norms, etc. The two

essentially form a game relationship. The significant divergence of goals among enterprises, universities, and other stakeholders is one of the key problems in the development of university-enterprise joint cultivation [2]. Clarifying the synergistic role of the two mentors can facilitate mentor team building and enhance the quality of teaching [3]. The institutionalization of industry-education integration and collaborative education can meet society's need for interdisciplinary talents [4]. Improving the dual mentor education mechanism and uniting universities and enterprises to promote resource sharing [5] and jointly build diversified integration platforms are of great theoretical and practical value [6].

1.2 Regarding the Issues Raised in the above Discussion

Existing literature mainly discusses the dual mentor system at the following levels:

The policy evolution of the dual mentor system has gone through three stages: the pilot period of the local experiments in 2015, the responsibility

lists in 2018, and the substantive collaboration quality improvement period in 2021.

At the institutional level, scholars call for clarifying rights and responsibilities, signing cooperation agreements, and establishing incentive mechanisms.

At the experience level, scholars describe the cooperation model in which enterprise mentors teach practice and university teachers teach theory.

With a focus on national strategic needs, organizational and institutional innovations [7] are adopted to effectively implement the dual-oriented training model; industry and education collaborate to build a diversified practical training ecosystem with real scenarios, concentrating efforts to achieve high-quality talent cultivation [8].

1.3 Theoretical Basis of the Relevant Research

The relevant theories of this study are shown in Table 1.

Table 1. Theories and applications

Theory	Content of cooperation	Function in this research
Stakeholder theory	The operation of any organization is affected by multiple stakeholders; therefore, the demands of all parties must be balanced. The "dual mentor system" involves major stakeholders such as students, university mentors, enterprise mentors, university administrative departments, enterprise human resources departments, and government education authorities. The interest demands of these parties overlap as well as conflict, and understanding these demands is the prerequisite for game analysis.	Identify the five types of primary stakeholders—government, universities, enterprises, university and enterprise mentors, and students—and their differences in interest demands.
Evolutionary game theory	The "dual mentor system" is a dynamic adjustment process under bounded rationality. Both university mentors and enterprise mentors are affected by factors such as time availability, teaching willingness, and performance pressure, and can continuously adjust their own behaviors according to the other party's action strategies, gradually forming a stable cooperation model.	Present the evolutionarily stable strategy (ESS) and replicator dynamics of the university and enterprise parties under the strategies of "deep participation/perfunctory participation".
Collaborative governance theory	Multiple subjects jointly participate in the decision-making and implementation process of handling public affairs. In the field of industry-education integration, effective collaboration is not only constrained by institutions such as contracts but also requires the support of mutual trust, reciprocity norms, and shared values.	Explain how the triple embeddedness of institution, trust, and incentive realizes the transition from game to collaboration.
Human capital theory	The essence of school-enterprise cooperation is that enterprises and universities jointly invest in human capital and, through mechanisms such as the "dual mentor system," reduce investment risk and increase returns.	Understand the dual mentor system as an investment–return contract for specific human capital.

2. Some Existing Problems

2.1 The Lack of Goal Consistency

The current government policy provides only

limited tax benefits and talent subsidies to enterprises; some enterprises think that joint cultivation is an "additional task". Studies have pointed out that the heterogeneity of interests and goals is a deep-seated obstacle to industry-

education integration. Zhang Shibin et al. developed a tripartite evolutionary game model involving the government, universities and enterprises, and showed that while universities and enterprises are willing to cooperate at the macro level, there are interest differences at the task level, resulting in the phenomenon of "integrating without depth". The cognitive mismatch of "enterprise mentors solve practical problems in engineering, while university mentors distill scientific problems" needs institutionalized coordination to prevent conflicts over resource allocation, mismatches in project selection, and misalignment in cooperative relationships. This is similar to the fact that in cross-border e-commerce practical training, enterprises focus on immediate business output, while universities focus on students' academic progression.

2.2 The Current Practices and the Existing Shortcomings

The typical practice of the dual mentor system in cross-border e-commerce practical training is that university teachers provide professional theory instruction, and enterprise mentors provide practical operation guidance, complementing each other. Currently, some universities have already used the turnover gained from platform training as a practical teaching assessment criterion, and established KPI rankings for practical teaching. But there are still the following weaknesses:

Treating complementarity as static. It is based on the premise that there can be a natural harmony between the two sides, without considering that when it comes to the same task, the guidance of "knowledge point coverage" and "ACOS control" may result in different behavior.

Insufficient collaboration rules. Where there is a conflict, it is mostly settled at "meetings" and a calculable constraint mechanism is lacking.

Single-dimensional evaluation indicators. Both purely KPI-based evaluation and purely knowledge-point-based evaluation lack a composite evaluation framework that

institutionally links the two.

3. Claim Game and Typical Tasks

3.1 The Differences in Demands Will Lead to a Game

The stakeholder interest demand matrix shows that the dual mentor system involves five parties: government, universities, enterprises, dual mentors and students, and the gaps between their interest demands are the starting point of the game.

Government: It aims to achieve industrial upgrading, employment stability, and supply-side reform of education through industry-education integration, and its interest demand is "maximizing policy leverage".

Universities: Talent cultivation quality, discipline assessment scores, horizontal research funding, employment rates are their interest demands; their demand is "education + ranking + resources".

Enterprises: They are interested in technological breakthroughs, low cost of labor, brand premium and tax incentives; their interest demand is the "input-output ratio".

University mentors: They want workload recognition and promotion of their professional titles; their interest is "accumulation of academic resources". Enterprise mentors: They are interested in job performance, subsidies, and industry reputation; their interest demand is "marginal benefits without affecting their primary job duties".

Students: They want employment competitiveness, value of academic qualification and internship subsidy; their interest demand is "appreciation of human capital".

Due to the differentiated assessment between universities and enterprises in the dual mentor system, the dual mentors are likely to become "two parallel lines".

3.2 The Typical Tasks of the Dual Mentor System

The main tasks of cross-border e-commerce practical training can be grouped into the following six categories (as shown in Table 2).

Table 2. Classification of Practical Training Tasks

Type of task	Typical action	The core concern of enterprise mentors (KPI)	The core concern of university teachers (knowledge system)
T1 Product selection and listing	Category research, competitor analysis, listing writing	First-month order rate, return rate	Market research methodology, information architecture, cross-cultural copywriting norms
T2	SP/SB ad setup, bid	ACOS, ROAS, budget	Data-driven decision-making process,

Advertising	optimization	consumption efficiency	A/B testing principles, attribution logic
T3 Pricing and promotion	Tiered pricing, coupons, Lightning Deal application	Profit margin, conversion funnel, inventory turnover	Price elasticity concept, promotional psychology, financial compliance
T4 Customer service and reviews	Email templates, negative review handling, refunds	Response time, positive review recovery, case rate	Cross-cultural communication, consumer protection law, service recovery theory
T5 Logistics fulfillment	Shipping plans, FBA inbound, tracking monitoring	On-time delivery, warehousing fees	Supply chain node knowledge, documentation knowledge, risk contingency capability
T6 Data review	Weekly report dashboard, funnel diagnosis	Period-over-period growth, anomaly attribution	Indicator system construction, data storytelling, visualization standards

Practice shows that conflicts between the dual mentors are mostly concentrated on "how to do it" and "what to practice first". Enterprise mentors hope that the tasks are aligned with this week's

store goals, and university teachers hope to guarantee that multiple knowledge points (as shown in Table 3) are included in the task.

Table 3. Conflicts and Causality during the Training Process

Hierarchical display	Corresponding manifestation	Root cause
Operational level	Task tickets are revised back and forth: enterprise mentors advocate "don't do complicated analysis, just launch ads", while university teachers argue "finish the competitor analysis form before touching the budget".	Time pressure vs. learning pace
Cognitive level	Enterprise mentors believe "results are everything", while university teachers believe "explainability is everything".	Performance accountability vs. educational accountability
Institutional level	Enterprise mentors need to achieve performance targets, and there is a lack of long-term incentives for investing in teaching, while university teachers are strictly subject to the review and constraints of course syllabi and teaching supervision.	Asymmetry of rights, responsibilities, and interests

4. Construction of the Collaborative Mechanism

To build the mechanism for the transition of the dual mentor model from game to collaboration, it is necessary to adjust and reform the institutions and establish a contractual linkage mechanism. The realization of the synergistic effect of the dual mentor system can be achieved through responsibility reconstruction, responsibility institution construction and responsibility relationship adjustment, which are the three forms of responsibility isomorphism [9].

4.1 The Specific Manifestations of the Game

Resource input game. A university mentor usually needs to supervise multiple students on enterprise practice, and is required to liaise with the enterprise, to review the practice journals and to deal with any emergency. In enterprises, typically only one mentor is assigned to give guidance to a batch of students. If there is no corresponding performance assessment, the enterprise mentor's enthusiasm will be low.

Role positioning game. University mentors expect students to fulfill learning tasks, while enterprise mentors require students, as "quasi-employees", to follow the requirements of

enterprise management.

Evaluation standard game. The university evaluation system is quantitative, while the enterprise system emphasizes practicality. Students may be unable to satisfy both the enterprise mentor and the university mentor at the same time, which weakens the educational effect of the dual mentor system.

Value orientation game. Universities value education and the all-round development of students, while enterprises emphasize market benefits and profit priority. Enterprise mentors are likely to assign work with low technical content, while university mentors expect students to be involved in core processes. Therefore, short-term utilitarianism and long-term educational goals form a deep value conflict.

4.2 The Mutual Accommodation Mechanism

The key incentive points for exploring the compatibility and mutual accommodation of the university-enterprise dual mentor system are as follows, relying on the "three-tier contract" structure, namely, the "framework tier" of the university-enterprise strategic cooperation agreement, the "project tier" of the implementation checklist and subsidy standard, and the "individual tier" composed of the dual

mentors and the student:

In the university: set up a special promotion channel for the professional title of "industry-education integration mentor" in the professional title review system; give "enterprise+" horizontal research projects the same rights and equivalent effect as vertical research projects.

On the enterprise side, implement the national *Implementation Measures for the Construction of Industry-Education Integration Enterprises* and the Action Plan for Empowering and Enhancing Vocational Education through Industry-Education Integration (2023–2025), and urge industry-education integration enterprises to carry out the empowerment and enhancement action plan.

For enterprise mentors: University libraries and laboratories are fully open to enterprise mentors; outstanding enterprise mentors can join the university academic committee and be awarded the title of "Adjunct (Practice) Professor".

The transition from "game" to "collaboration" is an integral part of the system of industry-education integration and cannot be ignored. Establishing a scientific, standardized, collaborative and efficient dual mentor guidance system [10] and constantly carrying out cultural integration and institutional innovation will continuously promote mutual empowerment and win-win cooperation among universities, enterprises and students.

4.3 Development and Evaluation of Course

Quantification of the "mentor collaboration index": the effectiveness of enterprise mentors' integration into the training program is assessed using the indicators of "number of topics selected", "guidance duration", "papers (patents)" and "student and enterprise satisfaction".

Create "modular teaching packages": combine the theory modules provided by university mentors with the project modules provided by enterprise mentors into an integrated course-post teaching package.

Students "provide two-way evaluations": Students rate the university mentor and the enterprise mentor respectively, and the ratings are included in the mentors' annual performance.

5. Conclusion and Look Forward to the Future

5.1 Conclusion

The "dual mentor system" in school-enterprise cooperation and industry-education integration is

a process of game and collaboration, like "two sides of the same coin":

First, game is the norm. Due to the objective differences between the goals of university mentors and enterprise mentors, the dual mentor system will inevitably result in situations of "more signboards than implementation". So, it is imperative to lower cooperation costs, increase the benefits of all parties, balance the game relationship, normalize collaboration, and build a long-term collaboration mechanism.

Secondly, collaboration is something that can be designed. Two-way incentives, equal evaluation rights, organizational isomorphism and three-tier contracts are all potential ways of achieving "deep collaboration" and establishing collaboration mechanisms, which include institutionalized communication, shared incentives, standardized rights and responsibilities, and a digital platform, as a means of realizing mutual empowerment between universities and enterprises.

Third, it is the transition that is important. The dual mentor system cannot rely solely on the "conscious cooperation" of the two mentors, but must embed collaboration into the entire chain of appointment, assessment, professional titles, resources and authority so as to achieve a "leap" from "heterogeneous responsibilities" to "isomorphic goals".

5.2 Limitations and Prospects

This paper is mainly based on qualitative analysis and research and lacks large-scale empirical data testing. Future studies can conduct large-scale questionnaire surveys to quantify the influence and weights of different factors.

With the in-depth development of artificial intelligence, new forms such as virtual mentors and intelligent teaching assistants are constantly emerging, and the traditional dual mentor pattern in education is being reshaped. The above research needs to be further verified and expanded in future exploration.

Acknowledgment

This work was supported by the AI Empowers School-Enterprise Collaborative Innovation to Create a New Model for E-commerce Talent Training - Based on the Research of Trueland Information Technology (Shanghai) Co., Ltd." project of Zhejiang Higher Education Institutions (Zhejiang Dongfang Polytechnic) in 2025 (FG2025248).

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