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Institutional Logics in Comparative Perspective: The Enrollment-Cultivation-Employment Chain in Sino-Foreign Cooperative versus Traditional Undergraduate Education

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Abstract: Sino-foreign cooperative education has emerged as a unique institutional form within higher education institutions in China. It functions with both traditional undergraduate programs and has different ideas of organizational logic. Combining the concept of institutional logics with the concept of capital in the sense of Bourdieu and with sociological approaches to institutional legitimacy, this paper compares the configurations of the enrollment-cultivation-employment (ECE) chain of these two educational models. Based on a comparative case study design of a Sino-foreign cooperative undergraduate program (ECE) and a traditional non-cooperative undergraduate program, especially focusing on the Process Equipment and Control Engineering program in a Joint International Institute at a national key university in Northeastern China as an example, the logics of state, market, academic, and transnational are identified as differently shaping each stage of the ECE chain. Results show that Sino-foreign cooperative programs are mostly market- and transnational-logic oriented and feature enrollment as a way of getting access to internationally oriented education, cultivation as the making of globally competent graduates, and employment as the proof of value added by the education pathway. In contrast, traditional programs are state- and academic-logic-driven programs that emphasize state-coordinated allocation, disciplinary depth, and domestic institutional legitimacy. Building on these empirical findings, the paper moves into more theoretical macro-level reflections on educational equity, the "internationalization at home" paradigm, and the balance between the import of global STEM resources and the fit with national higher education goals. This paper makes two main contributions to institutional logics theory: extending its use to the context of cross-border higher education and integrating the theory with institutional complexity, as well as adding the multidimensional ECE chain as an analytical tool to study institutional logics in practice.

Keywords: Institutional logics; Sino-foreign cooperative education; Enrollment-cultivation-employment chain; Educational equity; STEM talent cultivation; Internationalization at Home

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1. Introduction

Over the past four decades, China's higher education has been experiencing an amazing transformation; one of the most important institutional innovations is Sino-foreign cooperative education [1]. By now, over 460 institutions and programs of Sino-foreign cooperative education are being operated at the undergraduate

level or above at more than 120 of China's 147 "Double First-Class" universities. By definition, Sino-foreign cooperative education is an educational activity that is jointly managed by foreign educational institutions and local Chinese educational institutions, mainly targeted at Chinese citizens, and is carried out in the territory of China. Currently, the total number of Sino-foreign cooperative institutions and programs with the approval of the Ministry of Education at the undergraduate level and above has reached more than 1,700 [2]. These programs coexist with the traditional undergraduate education system, which is still the mainstay of China's higher education provision. Although they run in parallel within the same administrative university boundaries, the two models are rarely analyzed from a comparative institutional perspective, which can reflect their different principles of organization across the entire student lifecycle.

The educational system arranges and organizes student experiences and outcomes through the so-called "enrollment-cultivation-employment" (ECE) chain, which is a solid analytical framework. These stages—the recruitment process, the educational experience, and the transition to work—are indicative of the institutional logics that drive the behavior of organizations and the individual paths of students [3]. However, the research literature has tended to ignore these steps and systematically follow the logic of the link between steps from entry to graduate outcome in previous studies.

In this context of transnational higher education, public university faculties are constantly called upon to balance two forces: meeting public policy requirements and being market-oriented and internationally aligned. Sino-foreign cooperative joint programs offer a new dynamic hybridity, where domestic undergraduate programs have been the subject of a good deal of research regarding their relevance and fit with national development agendas and local labor markets. They introduce foreign curricular standards, new evaluation schemes, and double degree systems into public university campuses. This contrast in structure provides a site for a living laboratory of macro-level educational practices and institutional forces that shape micro-level education practices.

This paper addresses this gap by answering three core research questions:

(1) Institutional Logics Identification: What are the distinctive institutional logics that underpin enrollment, cultivation, and employment practices in Sino-foreign cooperative versus traditional undergraduate education?

(2) ECE Chain Manifestation: How do these divergent logics manifest across each stage of the ECE chain within an engineering discipline?

(3) Policy and Theoretical Implications: What are the broader implications of these logic configurations for social stratification, educational equity, "Internationalization at Home," and national STEM talent cultivation?

2. Literature review and theoretical foundations

2.1. Sino-foreign cooperative education: Institutional evolution and ambiguities

Sino-foreign cooperative education means that Chinese and foreign institutions jointly carry out educational activities in China. These institutions provide both "planned" (national Gaokao intake) and "unplanned" (independent recruitment) pathways and employ a variety of delivery models, including "4+0" models, "2+2," and "3+1" dual-degree mobility. Their importance in internationalizing curricula and speeding up progression in postgraduation is highlighted [4]. Yet the enduring ambiguity of institutional identity, target constituencies, and evaluation criteria poses the main analytical conundrum, which is ripe for comparative institutional

analysis.

2.2. Traditional undergraduate education: Institutional stability and structural discontents

Traditional undergraduate education operates within a very formalized and centralized national system under the control of the Ministry of Education. Students are centrally allocated to majors and admission is based on scores in the Gaokao. This system has offered not only significant institutional security and considerable wage advantages from attending the best universities [5], but it has also been observed to have a significant focus on uniform curricula, teacher-centered teaching, and a strong national focus.

2.3. Institutional logics perspective and organizational complexity

Institutional logics are those historically and socially constructed cultural symbols and material practices that allow individuals and institutions to give meaning to everyday activities [1]. As part of the discussion of higher education, the focus is on the interaction between state, market, academic, and managerial logics [6]. An extra "transnational logic" becomes visible in transnational contexts, which focuses on cross-border mobility, global accreditation, and dual degrees.

2.4. Analytical framework: The ECE logic chain

Table 1 shows the ECE logic chain.

Table 1. ECE logic chain

Logic	Core principle	Key actors	Manifestation in ECE chain
State logic	National strategic needs, educational sovereignty, public welfare, and regulatory compliance	Government, Ministry of Education	Enrollment quotas, standardized curricula, degree accreditation
Market logic	Competition, consumer choice, efficiency	Institutions, students, employers	Tuition fees, branding, employability metrics
Academic logic	Disciplinary depth, knowledge production, professional standards	Faculty, disciplinary communities	Curriculum rigor, accreditation, research output
Transnational logic	Global competitiveness, international standards, cross-border mobility	Partner institutions, international bodies	Dual degrees, English-medium instruction, global rankings

3. Comparative research design and empirical strategy

3.1. Case selection and comparative context

This study is a comparative case study design based upon a "most similar systems" logic. It is especially relevant to the study of the relationship between different institutional logics and their resulting differences in outcomes, as it enables the researcher to isolate the independent effect of the institutional arrangement by holding constant the broader organizational and environmental context.

We took two types of programs for the comparison: the Sino-foreign cooperative undergraduate programs and a traditional non-cooperative undergraduate program, which was operated at a national key university in China (hereafter called University X). University X, a "Double First-Class," is an institution with advantages in engineering majors located in Northeastern China. It has a multi-campus structure, comprising a Sino-foreign cooperative campus and the normal campus of the engineering school in the same

discipline. This institutional structure of having two distinct paths within one University system is well suited to a controlled comparison, because other institutional variables like general platform resources, institutional reputation, general engineering context, etc. are controlled.

In particular, the comparative emphasis is on the Process Equipment and Control Engineering discipline. We want to compare the Process Equipment and Control Engineering program offered at the Joint International Institute (cooperative track) of University X with the regular Process Equipment and Control Engineering program offered at the university's regular engineering school (non-cooperative track). Selecting two programs in the same specialized area of engineering at the same institution provides for the control of institutional-level variables. Any differences in student profile, pedagogical practices, or outcomes of graduates can therefore be reasonably explained by the different institutional logics of each track.

The cooperative program at the Joint International Institute is a Ministry-approved "4+0" dual-degree program designed in partnership with a prestigious research-intensive university from the UK. Students are only recruited within the national "planned" Gaokao quota and are subject to a special program code. Subject to all academic requirements being met, students are awarded dual degrees, one from the UK partner institution and one from University X. The tuition fee is fixed at 85,000 RMB per year.

The standard Process Equipment and Control Engineering program is, on the other hand, the traditional engineering undergraduate program that is guided by the normal national guidelines. The program is open for admission based on the regular Gaokao channel through standard public tuition (about 5,000–6,000 RMB/year). Graduates receive a single degree from University X. See **Table 2**.

Table 2. Comparative dimension of educational tracks

Comparative dimension	Traditional track	Sino-foreign cooperative track
Institutional affiliation	Standard Engineering School	Joint International Institute
Program duration	4 years	4 years ("4+0" model)
Partner institution	N/A	UK prominent research-intensive university
Tuition (per year)	~5,000–6,000 RMB	85,000 RMB
Degree conferral	Single degree (University X)	Dual degrees (University X + UK partner)
Admission channel	Regular Gaokao code	Dedicated program code
Annual intake	~120 students	~100 students

This setup allows for sharing the same university governance, the same campus facilities, the same regional labor market, and the same disciplinary field by the two tracks, thus facilitating a powerful controlled comparison of institutional logic effects.

One of the most significant measures of the success of the cooperative track is the percentage of post-graduates from the track who are employed. We have over 80% overall postgraduate progression rate at the cooperative in the recent graduating cohorts, domestic progression post-university to C9 League universities (like Peking University, Tsinghua University, Zhejiang University, Nanjing University, Fudan University) and international progression post-university, including world-leading universities like Oxford University, Cambridge University, Imperial College London, University College London, and other world-leading universities. 100% of the cohort achieved a placement in employment or further study, and the employment sectors ranged from equipment manufacturing and aerospace to automotive and shipbuilding, the new generation of information technology, new energy, education and research, financial and economic industries, and government organizations. The outcomes offer a tangible empirical validation point for considering the

translation from the cooperative track institutional logic construct to actual student performance, and will be explored in depth during the findings section.

3.2. Empirical evidence base

The empirical evidence base comprises three triangulated data streams [7], enabling us to distinguish between espoused logics (what institutions claim), enacted logics (what practices reveal), and demonstrated outcomes (what graduate destination data show):

(1) Textual data: Institutional policy documents, Ministry of Education regulations, official teaching plans, syllabus specifications, joint training schemes and annual employment quality reports [8]. They are documents that formalize institutional logics, which show how each track formulates its educational goals, curricular frameworks and envisaged products. The Joint Training Scheme documents are particularly important, in that they detail the split of curriculum between the University X and the UK partner institution, and the official employment quality reports are invaluable with regard to where graduates end up.

(2) Perceptual data: Semi-structured interviews with academic administrators (including program directors from both tracks), current undergraduate learners, and graduates of the programs. The interview protocol included questions that explored stakeholder perceptions of unique features of each educational model, experienced challenges and opportunities, and their adaptation to the institutional context. The perceptual data provides insights into the ways in which institutional logics are experienced, interpreted, and negotiated by actors as they enact them in practice, which are dimensions not captured in text documents.

(3) Quantitative metrics: Granular cohort-level data covering Gaokao entrance cutoffs, tuition levels, foreign language proficiency test scores, domestic/international postgraduate progression rates, and initial employer distribution (e.g., state-owned manufacturing enterprises, engineering design institutes, multinational corporations). These metrics enable systematic comparison of student inputs (admission selectivity), value-added during cultivation (language proficiency gains), and outputs (graduate destinations). Quantitative metrics are drawn from institutional announcements, official reports, and publicly available data.

3.3. Analytical strategy

Our analytical procedure follows a two-stage process designed to ensure both theoretical grounding and interpretive depth:

(1) Stage One: Deductive Thematic Coding. All the textual and interview data were coded in terms of the four institutional logics mentioned in our theoretical framework: state, market, academic, and transnational. With this deductive coding system, our analysis stays grounded in the institutional logics perspective, while also making it possible to see how each institutional logic is manifested in the practices. Sub-codes were derived for every ECE stage, such as “state logic-enrollment” for when enrollment practices show state-coordinated allocation and “transnational logic-cultivation” for when curriculum design shows international standards and connections.

(2) Stage Two: Interpretive Cross-Case Synthesis. After coding, coding patterns of the two tracks were compared to observe the convergent and divergent illustrations of institutional logics. The following

comparative synthesis included exploring (a) the dominant and subordinate logics that were present within each ECE stage, (b) the changes or stability in configurations across ECE stages, and (c) the relationship between configurations and differential student outcomes observed. The synthesis was then made coherent as a comparative narrative in the findings section along the three ECE stages.

4. Findings: The ECE chain in comparative perspective

4.1. Enrollment: How two educational tracks shape student access

The Sino-foreign cooperative Process Equipment and Control Engineering program's enrollment runs in parallel with the state-authorized and market-oriented educational positioning. The cooperative program is based on the national Gaokao threshold and has exactly 85,000 RMB tuition per year (while the regular program is about 5,000 to 6,000 RMB/year). This price gap is an illustration of the education and resources gap between the two tracks. Opting for this track usually implies that families have more defined ideas regarding their children's international development, and they see the dual-degree as an important method for improving their children's competitiveness on an international level via access to internationally oriented curricula.

In contrast, the traditional Process Equipment and Control Engineering course, on the other hand, represents, to a large extent, state and academic logics. There are no language filters or tuition premiums, and admissions are based solely on centralized Gaokao score rankings. The resulting student body displays broader socioeconomic diversity and uniform domestic academic preparation.

4.2. Cultivation: Curriculum and instruction across two tracks

The cooperative program applies a hybrid pedagogical model including transnational elements during the process of its cultivation. The curriculum is a mix of the UK partner university module specifications, English-medium instruction, interactive workshops, lab operations, and ongoing assessment schemes. Academic administrators balance foreign module requirements with the standards of core engineering training in home countries via strategic hybridity.

On the other hand, the traditional Process Equipment and Control Engineering program is based on national guidance on teaching in this discipline. Teaching concentrates on sound mathematical bases, mechanical design, thermal/fluid mechanics, and broad theoretical tests within the traditional framework of domestic standards. It is interesting to note that even the traditional domestic engineering courses are actively internationalizing and innovating pedagogy, for example, in the process of national "Emerging Engineering Education" (Xin Gong Ke). This difference between the two models is an expression of differences in priorities of institutional logic and pathways of resource allocation, not a difference in educational quality.

4.3. Employment: Graduate destinations in two educational tracks

For employment, students from the cooperative scheme have gone on to some of the world's most prestigious universities (Oxford, Cambridge, Imperial College London, UCL) as well as the quality domestic universities with research emphasis (C9 universities). Employed graduates are attracted to sectors of strategic interest, such as aerospace, advanced manufacturing, new energy, and multinational engineering consultancy.

On the other hand, students of the conventional Process Equipment and Control Engineering seamlessly align with domestic institutional legitimacy. A significant number of students enter domestic graduate

programs directly through the national examination (Kaoyan) or major state-owned enterprises and traditional chemical/mechanical engineering institutes and national research facilities, where local degree requirements meet public sector recruitment catalogs easily.

5. Discussion and implications

5.1. Path dependency and institutional continuity

The ECE chain is a self-reinforcing institutional system in which early-stage mechanisms have a huge impact on later outcomes. Differentiated enrolment design selects students with a high international interest and linguistic readiness and steers a special language-oriented cultivation process. This pedagogical environment nurtures cross-cultural skills and internationally recognized credentials which, in turn, tend to guide graduates to internationally oriented or advanced domestic graduate studies (in institutions of the C9 League) and to leading international Universities. The institutional logics thus form a coherent trajectory, not necessarily a lock-in, which is systematically influential in shaping the pathway of students' situation by reinforcing their initial choices, with congruent educational practices.

5.2. Micro-level hybridity and institutional adaptation

As opposed to passive friction or even overt conflict between local clear-cut demands and the UK high-profile research-based university norms, front-line staff and head academics actively devise creative institutional adaptations. As micro-level institutional entrepreneurs, they constantly compromise and combine transnational practices (e.g. interactive workshops, continuous assessment, English-medium instruction) and tough local regulatory demands. This strategic hybridity enables the institution to provide an actual international experience to students and at the same time remain fully compliant with national law, the Ministry of Education, and the mandatory requirements for granting degrees at home.

5.3. Policy implications: Balancing global competence and STEM talent cultivation

The remarkable empirical achievements in the cooperative track, typified by the high rate of post-graduate enrollment, more than 80%, and high-quality placement in pivotal strategic national industries including aerospace, new energy and advanced manufacturing, are indicative of the successful application of Sino-foreign cooperative education as a strong "Internationalization at Home" engine. It is important to note, however, that the greater expense of cooperative programs could impact the access of students from a variety of socioeconomic backgrounds. To counter this, some institutions have started to provide merit-based scholarships and need-based financial aid as first steps to balancing out internationalization and equitable access. These joint programs provide globally competitive STEM training within domestic administrative jurisdiction, thus helping to keep high-potential STEM students from seeking foreign undergraduate degrees. Therefore, a more sensitive approach is needed in higher education policy formulation to link the high competitiveness of education with its ability to support the development of national STEM talents.

6. Conclusion

This study shows that the logic pattern of Sino-foreign cooperative education and traditional undergraduate education exists in an essential difference along the ECE chain. This paper explores the interconnections

between and within these three dimensions—enrollment, cultivation, and employment—to shed light on how hybrid institutions can impact educational pathways, academic practices, and outcomes in engineering education today.

Disclosure statement

The authors declare no conflict of interest.

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