Building Boundary-crossing Infrastructures for Faculty Development in China's Vocational Universities

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Abstract. China's move to bachelor-level vocational education has intensified a longstanding faculty problem: universities must raise academic capacity while keeping teaching connected to contemporary occupational practice. This study examines how newly upgraded vocational universities organise that connection. An abductive, theory-informed longitudinal document analysis was conducted on the 2023 quality reports of 31 Chinese vocational universities and 26 matched reports from 2025. The analysis identified four connected infrastructures: boundary positioning, boundary access, practice translation and institutional reinforcement. Across the two periods, cross-boundary work became more platform based, and occupational tasks, standards and projects were more often linked to curricula, teaching resources and assessment. Practice translation was the most consequential mechanism because workplace contact affected teaching only when occupational knowledge was reconstructed for educational use. Institutional reinforcement helped retain such work through evaluation and quality routines, although employer participation, translation capacity and digital or applied-research capability remained uneven. The study extends boundary-crossing research by showing how organisational arrangements can make movement between education and work recurrent and institutionally consequential during VET tertiarisation.

Keywords: vocational universities; vocational teachers; boundary crossing; faculty development; education–industry partnership; tertiarisation; China

1 Introduction

Vocational education and training (VET) is moving further into higher education. Tertiarisation can widen progression routes and support advanced occupational learning, yet institutional upgrading may also weaken vocational institutions' connection with work. Research on vocational universities has described this tension as a form of academic drift when university status, credentials and academic routines expand faster than occupationally grounded practices (Coleman and Tuck, 2020; Li et al., 2024). Faculty work is where this tension becomes especially visible. Vocational teachers are expected to combine pedagogical expertise with current occupational competence even

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though these forms of expertise are developed, recognised and renewed in different settings (Fejes and Köpsén, 2014; Zhou et al., 2022).

China offers a useful case of rapid, policy-led VET tertiarisation. Since 2019, selected vocational colleges have been authorised to deliver bachelor-level vocational education. Recent research in Education + Training has documented changes in the status of Chinese VET and the policy effort to institutionalise closer relations between vocational education and industry (Hao et al., 2025; Jin et al., 2025). Chinese studies of vocational universities likewise report staffing constraints and growing concern with forms of 'dual competence' that combine occupational and pedagogical capability (Hu et al., 2025; Yao, 2024). The institutional consequences remain less clear. Teacher-level studies explain identity formation and workplace learning, while studies of upgrading focus more often on policy, status or programme structure. How newly upgraded universities organise cross-boundary faculty work has received less sustained attention.

This study addresses that organisational question through quality reports issued by China's first cohort of vocational universities. It asks how these institutions construct arrangements that support faculty movement between educational and occupational practices, and how those arrangements develop over time. The argument is that boundary crossing depends on more than individual mobility. It also requires institutional arrangements that define a hybrid faculty role, create sustained access to occupational settings, convert work into educational resources and recognise such activity within evaluation and quality systems.

2 Literature Review and Theoretical Framing

2.1 Vocational Teachers Across Education and Work

Vocational teachers commonly build their professional identities across occupational practice, teaching and teacher education. Fejes and Köpsén (2014) show that identity formation develops through repeated movement between occupational and teaching communities, with earlier occupational expertise reinterpreted in the teaching role. Bound (2011) similarly demonstrates that professional development is shaped by workload, organisational histories and workplace cultures. A systematic review of 54 studies found that vocational teachers learn through formal development, workplace participation, collaboration and everyday practice across school and industry, with uneven effects on pedagogy, occupational knowledge and professional identity (Zhou et al., 2022). Antera and Teräs (2024), writing in Education + Training, further show that occupational experience must be reworked within a teaching community before it becomes part of a vocational teacher identity. Chinese interview research reaches a related conclusion: enterprise practice becomes professionally significant through processes of identification, coordination, reflection and transformation across school and workplace settings (Sun and Sun, 2025).

These studies establish the value of movement across settings, but they also caution against equating workplace access with professional change. Teachers need opportunities to interpret occupational experience and bring it back into curriculum and ped-

agogy. For vocational universities, this problem is intensified by bachelor-level expectations in curriculum design, graduation projects, applied research and quality assurance. The faculty system therefore has to combine higher-level academic work with continuing occupational relevance.

2.2 Boundary Crossing and Organisational Infrastructure

Boundary crossing concerns efforts to work across sociocultural discontinuities. Boundary objects are artefacts that can be used by different communities while retaining enough common identity to support cooperation (Star and Griesemer, 1989). Akkerman and Bakker (2011) synthesise four learning mechanisms at boundaries: identification, coordination, reflection and transformation. Their framework has been influential because it treats difference as a potential resource for learning as well as a source of discontinuity. Multilevel work later showed that boundary crossing can unfold simultaneously across individual, organisational and inter-organisational levels (Akkerman and Bruining, 2016).

Most vocational teacher studies nevertheless foreground the teacher's learning trajectory. Less is known about the institutional arrangements that make cross-boundary work recurrent, visible and consequential. This study uses the term boundary-crossing infrastructure for the connected roles, partnerships, intermediary platforms, shared artefacts and evaluation routines through which an institution organises faculty engagement with occupational practice. Four functions guide the analysis. Boundary positioning defines the faculty role expected in bachelor-level vocational education. Boundary access creates sustained contact with occupational actors and settings. Practice translation converts occupational tasks, standards and projects into curriculum, resources and assessment. Institutional reinforcement embeds this work in evaluation and quality routines. The research gap therefore lies at the meso level: how institutions organise and retain cross-boundary faculty work during VET tertiarisation.

This emphasis also helps distinguish the present study from existing research on Chinese vocational universities. Prior work has documented staffing profiles and development needs through quality reports (Yao, 2024), while international comparative research has mapped the institutional movement of VET towards higher education (Li et al., 2024). Neither line of work fully explains how occupational relevance is maintained once an institution begins to operate at bachelor level. The question is therefore not simply whether faculty possess industry experience. It is how organisations provide repeated access to occupational practice and how they make the resulting knowledge usable in programmes, courses and assessment. That distinction gives the analysis a concrete empirical focus and prevents boundary crossing from being treated as a metaphor for any form of collaboration.

3 Research Context and Method

The study analysed publicly released quality reports from vocational universities established or upgraded between 2019 and 2021. These reports combine narrative ac-

counts, statistical tables and selected cases covering faculty, curriculum, industry partnerships, applied research, social service and quality assurance. The primary corpus comprised 31 reports from 2023. A follow-up corpus comprised 26 matched reports from 2025; unavailable reports were coded as missing and carried no inference about the underlying practice.

An abductive, theory-informed longitudinal document analysis was used (Bowen, 2009; Timmermans and Tavory, 2012). First-cycle coding remained close to the documents and captured actions such as recruiting industry professionals, arranging workplace placements, establishing industrial colleges, co-developing courses, using authentic projects, providing technical services, developing digital resources and reforming faculty evaluation. Coding extended beyond human-resources sections to curriculum, partnerships, service, internationalisation, quality assurance and challenge sections whenever faculty work was implicated. Cross-case comparison then grouped codes according to the institutional function they performed. The resulting categories were then read against boundary-crossing theory, which informed interpretation without serving as a predetermined coding frame. Finally, the 2025 reports were examined for continuity, elaboration, redirection and constraint; they were used for temporal corroboration and theoretical refinement, not independent model validation.

A case-by-theme matrix and codebook preserved the link between source passage, descriptive code and analytical category. Institutional claims were checked against cases, tables and challenge statements, and negative evidence was retained. Coding was conducted in Chinese; English labels were chosen for conceptual equivalence. The analysis concerns reported institutional arrangements and authorised representations of practice. The documents do not establish teachers' lived learning, implementation quality or measured capability gains.

4 Findings

4.1 Boundary Positioning: Defining A Hybrid Faculty Role

The first infrastructure concerned how institutions defined faculty work after upgrading. Reports linked bachelor-level development to stronger capacity in curriculum design, graduation-project supervision, applied research and quality assurance. The same reports described industry mentors, engineers, master craftworkers, part-time practitioners and teachers with workplace experience. The reported ideal therefore combined academic and occupational legitimacy. This resembles identification at a boundary: institutions were clarifying how vocational university faculty should differ from both sub-degree vocational teachers and conventional university academics.

The 2025 reports placed this hybrid role more explicitly within professional-cluster development, workplace-oriented engineering programmes and bachelor-level review. The pattern indicates movement from meeting initial staffing thresholds towards strategic configuration of faculty capability. Tension remained, however. Challenge sections referred to shortages of doctoral and senior staff, difficulties attracting industry leaders and uneven practical capability among academic recruits. When promotion

systems valued publications or formal credentials more clearly than occupational work, the balance could shift towards academic drift.

4.2 Boundary Access: Organising Sustained Contact with Occupational Practice

The second infrastructure created access to occupational settings, people and problems. In 2023, common arrangements included workplace placements, enterprise mentors, joint teaching teams, master studios and industrial colleges. The later corpus showed more pronounced platformisation through regional industry–education alliances, sectoral communities, industrial colleges and practice centres. These forms reduced reliance on individual contacts and created intermediary spaces in which faculty and industry personnel could participate in programme design, teaching, textbook development and technical work.

Liaoning Vocational University of Technology illustrates the pattern. Its 2025 report combined faculty workplace practice, enterprise part-time teaching and joint curriculum development within the same partnership structure. What matters in this example is the coupling of staff mobility, employer participation and curriculum work within a single partnership structure. Platformisation did not remove asymmetry. Reports still acknowledged shallow employer participation and institution-led cooperation. An alliance or industrial college provided a channel for contact, but its existence alone did not show that occupational knowledge had entered teaching.

4.3 Practice Translation: Converting Work into Educational Resources

Practice translation was the most consequential infrastructure in the corpus. Industry engagement affected education when faculty converted occupational tasks, standards, technologies and projects into curriculum content, authentic assignments, textbooks, digital resources or assessment criteria. Four forms recurred. Occupational tasks and competency standards informed course content; enterprise projects were redesigned as classroom, workshop or graduation-project tasks; applied research and technical services generated cases and data; and employers participated in programme specifications, textbooks or assessment. These activities required pedagogical reconstruction because work processes cannot simply be transferred intact into a course.

The longitudinal evidence suggested a shift from isolated examples towards more systematic redesign. Liaoning's reports linked technical-service cases, occupational certificates, competition tasks and enterprise co-development with teaching materials. Nanchang Polytechnic University connected faculty development in artificial intelligence with integrated courses, virtual training platforms and case development. Hebei Vocational University of Technology and Engineering linked occupational analysis to a capability map and curriculum redesign. In these cases, digital tools acted as potential boundary objects only when teachers reorganised them for learning and assessment. The distinction between access and translation therefore provides a stricter test of partnership quality: placements and agreements indicate contact, whereas changes in curriculum, resources and assessment indicate educational consequence.

The same logic was visible in less technology-intensive cases. Some reports described teachers bringing enterprise problems into project teaching, using technical-service experience to revise examples, or involving practitioners in the formulation of graduation tasks. Such practices matter because they show a return movement across the boundary. The teacher does not merely enter a workplace; occupational material is selected, simplified where necessary, sequenced and aligned with learning outcomes. This return movement is where the educational judgement of vocational teachers becomes visible. It also explains why two institutions with similar levels of employer contact may obtain different educational value from that contact. Translation depends on teachers' pedagogical capacity, access to suitable artefacts and an organisational expectation that workplace experience should leave a trace in the curriculum.

4.4 Institutional Reinforcement: Retaining Cross-Boundary Work

The fourth infrastructure embedded cross-boundary activity in organisational rules and quality processes. Reports described teacher-development centres, placement regulations, workload arrangements, performance incentives, teaching teams, course review, graduation-project supervision and internal quality assurance. Such arrangements made faculty development an organisational responsibility and signalled which forms of work were recognised. By 2025, faculty development was more often connected with bachelor-level review, digital monitoring and curriculum evaluation. Cross-boundary activity was increasingly incorporated into routine governance instead of remaining a project or training event.

Reinforcement remained uneven. Several reports acknowledged that conventional academic outputs were recognised more clearly than partnership maintenance, curriculum reconstruction or technical service. Across both periods, four constraints persisted: shortages of faculty combining advanced academic qualifications with current occupational expertise, uneven employer participation, weak conversion of workplace activity into teaching, and gaps in digital or applied-research capability. These constraints reveal the interdependence of the four infrastructures. Positioning without access produces an aspirational faculty profile; access without translation produces experience with limited educational effect; translation without reinforcement remains project dependent; reinforcement without authentic access risks procedural compliance.

5 Discussion and Implications

5.1 From Individual Boundary Crossing to Institutional Infrastructure

Boundary-crossing theory has primarily explained how participants identify differences, coordinate activity, reflect across practices and transform work (Akkerman and Bakker, 2011). Research on vocational teachers has shown how occupational and teaching identities are negotiated through movement between communities (Fejes and Köpsén, 2014; Antera and Teräs, 2024). The present study adds an organisational account. Teachers' cross-boundary work depends on access to employers, intermediary

platforms, shared artefacts, time, recognition and quality routines. The four infrastructures specify different institutional functions: positioning legitimises the hybrid role, access creates contact, translation turns contact into educational resources, and reinforcement helps retain the work. This extends the multilevel argument of Akkerman and Bruining (2016) by showing how organisational and inter-organisational arrangements shape what moves across a boundary and whether it remains available to the institution.

5.2 Tertiarisation, Translation and Partnership Quality

The framework (Fig.1) clarifies the faculty problem created by VET tertiarisation. Upgraded institutions need stronger academic capability, yet occupational relevance depends on continuing contact with changing work. Boundary-crossing infrastructure offers one way to hold these demands together. Boundary positioning prevents bachelor-level development from being defined only through conventional university credentials. Boundary access maintains contact with occupational practice. Practice translation links that contact to curriculum and assessment, while institutional reinforcement makes such work count within the institution's definition of quality. This helps explain why formal industry partnerships can expand without producing equivalent curricular depth.

Practice translation is especially important for evaluating education–industry partnerships. Policy and institutional reports often count placements, agreements, participating firms or platforms. Those measures capture contact. Translation asks a more demanding question: what changed in teaching because the relationship existed? Curriculum standards, project briefs, textbooks, simulations and assessment rubrics can operate as boundary objects when educators and industry practitioners use them to coordinate around shared artefacts (Star and Griesemer, 1989). The educational value of a partnership therefore rests less on its formal scale than on its capacity to generate teachable, assessable and reusable resources.

For institutional practice, workplace participation should be designed with translation outputs in view. Industrial colleges and alliances need operating rules for staff mobility, employer contribution and joint curriculum work. Faculty workload and promotion systems should recognise partnership maintenance, curriculum reconstruction and technical service alongside academic output. Digital capability should be treated as occupational–pedagogical integration: teachers need to represent contemporary work processes and technologies in forms that support learning and assessment.

The implications also concern evaluation. A partnership that produces frequent visits but no change in teaching should not be treated as equivalent to one that generates revised tasks, shared resources or new assessment criteria. This does not require reducing partnership quality to another numerical index. It requires institutions to document the chain from occupational engagement to educational use. Such evidence would make quality assurance more sensitive to the substance of vocational learning and would give faculty clearer recognition for the work of translating practice.

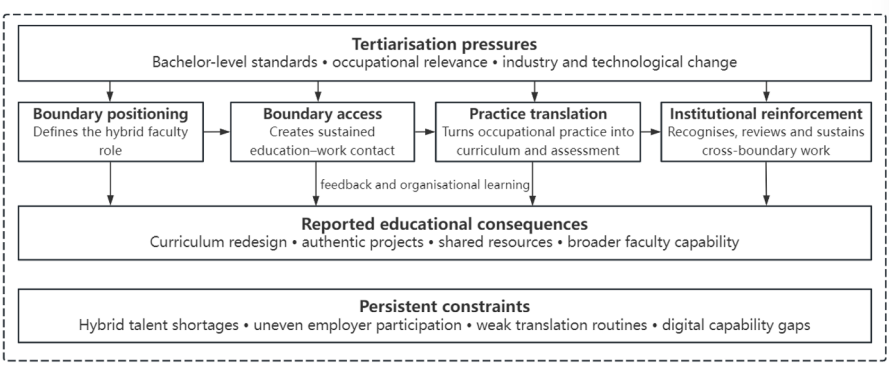


Fig. 1. Boundary-crossing infrastructure for faculty development in vocational universities

6 Conclusion and Limitations

This study identifies four infrastructures through which China's vocational universities organise faculty boundary crossing: boundary positioning, boundary access, practice translation and institutional reinforcement. The evidence shows why workplace contact cannot be treated as a proxy for faculty or curriculum transformation. Occupational tasks, standards, projects and technologies have to be reconstructed in forms that can be taught and assessed, and this work requires organisational recognition if it is to persist. The claims are consequently restricted to the institutional conditions of boundary crossing; measured learning outcomes fall outside the evidence available here.

The study relies on institutional self-reports, which privilege selected achievements and cannot establish implementation quality, teacher experience or student outcomes. Five missing follow-up reports also limit longitudinal completeness. Future work should combine documents with teacher and employer interviews and examine how particular curriculum artefacts are produced and used across the education–work boundary.

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