

Research on Development Pathways and Strategies for Graduate Supervisor Teams from the Perspective of The Educator Spirit

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Abstract: As the primary accountable entity in graduate education, supervisors bear the vital mission of cultivating high-level innovative talents and fostering innovation for the nation. By elucidating the contemporary significance and value of The Educator Spirit, this article highlights its critical guiding role in developing the graduate supervisor team. Building on an in-depth analysis of the current state of supervisor team development, the study proposes constructive measures—centered on inheritance, innovation, and leadership—to address existing challenges. These strategies provide valuable insights for cultivating a high-caliber, highly skilled, and highly competent graduate supervisor workforce.

Keywords: The Educator Spirit; Graduate Students; Supervisor Team

1. Introduction

As the primary accountable entity in graduate education, the quality of the supervisor team directly impacts the caliber and outcomes of graduate training. To this end, the state has introduced a series of policy documents to establish an institutional framework for supervisor team development. Pivotal directives such as Opinions on Fully Implementing Graduate Supervisors' Responsibility in Fostering Virtue and Cultivating Talents and Opinions on Accelerating the Reform and Development of Graduate Education in the New Era—issued by the Ministry of Education and other ministries—explicitly integrate political integrity, professional ethics, academic competence, and educational effectiveness into the supervisor evaluation system. These policies call for improving mechanisms for supervisor selection, training, assessment, and incentives while emphasizing supervisors' dual roles as academic guides and moral exemplars for graduate students^[1,2]. In 2020, the Ministry of Education further issued the Guidelines on Strengthening Doctoral Supervisor Position Management and Code of Conduct for Graduate Supervisor Guidance, standardizing supervisory practices and reinforcing the mandate of fostering virtue through education^[3,4]. These policy instruments underscore the strategic significance of the graduate supervisor workforce and provide robust institutional safeguards for its development.

"A strong nation must first strengthen its education, and strengthening education requires strengthening teachers first." As pivotal members of this workforce, graduate supervisors bear the critical mission of cultivating top-tier innovative talent for the nation^[5]. With China's continuous expansion of graduate enrollment (2023 admissions exceeded 1.3 million, with total enrollment reaching 3.88 million^[6]), supervisor team development faces multifaceted challenges. Serving as the guiding principle for modern teacher development, the educator spirit offers innovative approaches to enhancing graduate supervisor teams.

The educator spirit represents the core value pursuit in education, embodying a profound dedication to the profession, the relentless pursuit of knowledge, deep compassion for students, and a strong commitment to societal progress^[7]. As the pioneering educator Cai Yuanpei asserted, "Education serves neither the past nor the present, but exclusively the future"—a philosophy whose practice epitomizes the timeless relevance of this spirit. Within the contemporary context of graduate supervisor team development, the educator spirit provides indispensable guidance: it not only ignites supervisors' passion for educational excellence but also propels the overall quality enhancement of the supervisor workforce. Simultaneously, this ethos steers supervisors toward establishing sound pedagogical philosophies and transformative talent development objectives, thereby furnishing robust safeguards for high-quality graduate education.

2. Current status and challenges in graduate supervisor team development

In recent years, as China's higher education has entered a new phase of massification, graduate education has witnessed rapid enrollment expansion. As the cornerstone of graduate training, institutions have intensified efforts to develop supervisor teams while navigating the dual pressures of scale growth and quality enhancement. The Ministry of Education statistics indicate that the national supervisor pool has surged from 128,700 in 2003 ^[8] to 625,100 in 2022 ^[9] (Figure 1), achieving a 9% compound annual growth rate and establishing the world's largest graduate supervisor base. However, this quantitative expansion has concurrently exposed structural tensions—including ethical misconduct, disciplinary imbalances in faculty allocation, generational disparities in mentoring competence, and rigid academic evaluation paradigms—that continue to constrain the high-quality development of graduate education.



Figure 1 National graduate supervisor count: Historical trend

2.1 Inadequate development of professional ethics

While the overall professional ethics standards of graduate supervisors have significantly improved in recent years, persistent issues remain: isolated cases reveal ambiguous ideals and deficient compassion among certain individuals, whereas utilitarian tendencies leading to neglect of personalized student development—and even academic misconduct ^[10]—are evidenced by incidents such as 15 graduate students jointly reporting chronic verbal abuse, forced over time, and assignment of nonacademic tasks, severely damaging the profession's reputation. Furthermore, ethical oversight mechanisms remain hampered by form-over-substance approaches with insufficient long-term frameworks, and exemplary case education requires strengthening to prevent ethical breaches.

2.2 Pronounced structural imbalances

The structural composition of the supervisor team encompasses its demographic distribution across age, academic lineage, professional rank, and disciplinary specialization. A significant age imbalance is evidenced by 2022 Ministry of Education data: among 625,061 national graduate supervisors, early-career mentors under 40 constitute only 24.22%, whereas the middle-career (40--54) and senior (55+) cohorts constitute disproportionately high shares of 55.85% and 19.93%, respectively ^[9] (Figure 2). This deficit in younger supervisors poses generational discontinuity risks, undermining the workforce's sustainable development capacity. Furthermore, disciplinary distribution remains uneven, with oversaturation in popular/priority fields contrasting with shortages in emerging specialties, thereby impeding comprehensive disciplinary advancement and ecosystem equilibrium. Simultaneously, critical deficiencies in cross-disciplinary supervisors restrict interdisciplinary research support, ultimately constraining the enhancement of graduate students' comprehensive competencies and innovative potential.

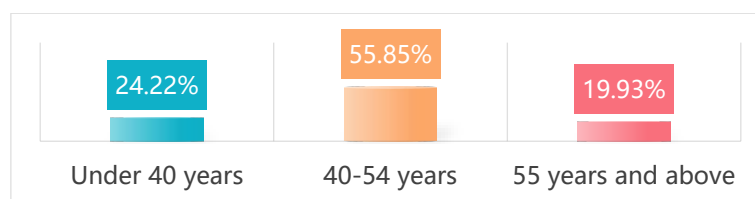


Figure 2 2022 Supervisor age distribution (%)

2.3 Flaw management mechanisms

Supervisor management has systemic deficiencies, including inconsistent recruitment standards across institutions with excessive reliance on research output ^[11], neglect of teaching and mentoring competence assessments, and inadequate monitoring of supervisory engagement (time investment, frequency, and content quality). Concurrently, evaluation systems prioritize publication metrics while lacking dynamic assessment of student developmental outcomes—reflecting an institutional bias toward research over mentorship. Some universities have yet to implement performance-based "up-or-out" appointment mechanisms, sustaining de facto lifelong tenure that fosters professional complacency and academic stagnation ^[5]. Furthermore, preservice and in-service training programs remain nonstandardized and are characterized by formulaic delivery methods, superficial content, and inadequate duration, which collectively undermine training efficacy. These programs disproportionately emphasize academic guidance and research skills while underpowering ideological-political education, professional ethics cultivation, and communication strategies.

2.4 Mentoring competence requires enhancement

Mentoring competence stands as a pivotal element in supervisor team development, critically influencing graduate students' academic progression and career trajectories. However, some supervisors demonstrate limited innovation and foresight in research, hindering their capacity to produce high-impact scholarly outputs—a shortfall that constrains both their professional advancement and the quality of graduate training. Amidst continuous enrollment expansion, institutions have relaxed recruitment criteria to increase supervisor numbers, yet persistent shortages are evidenced by worsening student-supervisor ratios (rising from 5.06:1 in 2003 to 5.85:1 in 2022, Figure 3) despite two decades of growth. Concurrently, significant divergence in overall supervisor caliber compromises consistent mentoring quality, with overextended supervisors resorting to either negligent or exploitative overdirection ^[10], resulting in deficient personalized guidance.



Figure 3 Historical trends of national student-supervisor ratios for graduate programs

2.5 Lagging development of professional degree supervisor teams

Professional degree programs necessitate "dual-qualified" supervisors possessing both academic and industry expertise, yet systematic frameworks for developing such supervisor teams remain underdeveloped. Recruitment exhibits pronounced academic bias, with most institutions prioritizing scholarly publications and research grants while undervaluing professional experience—some even maintain identical hiring criteria for professional and academic degree supervisors. The dual-supervisor system suffers from ineffective implementation: inconsistent industry mentor appointments, inadequate regulatory oversight, and nominal participation ("honorary appointments") ^[12] result in minimal substantive guidance during training. Consequently, 79.4% of professional degree students report lacking industry mentors ^[13].

2.6 Limited international engagement

Supervisors' global competence is a critical determinant of internationalization in graduate

education. Currently, China's supervisor workforce is uneven and generally subpar international engagement levels^[14], constrained by traditional pedagogical models and institutional frameworks. This manifests through imbalances in internationally educated supervisors—particularly acute in central/western institutions—alongside restricted participation in global exchanges owing to linguistic limitations, hindering effective utilization of international resources and frontier scholarship access.

These challenges reveal significant gaps between current supervisor development and the educator spirit's ideals. An imperative exists to reform supervisor teams through this ethos: strengthening ethical cultivation, optimizing structural composition, refining governance systems, enhancing mentoring capabilities, and broadening global perspectives. Such reforms will cultivate morally and intellectually accomplished supervisors aligned with new-era demands, ultimately revitalizing educational excellence.

3. Pathways and strategies for graduate supervisor team development

China's graduate education currently stands at a critical juncture of connotative development and quality enhancement. Amidst continuous enrollment expansion and increasing diversification of training models, novel and heightened demands are being placed on supervisor teams regarding scale, structure, and caliber. This new landscape necessitates comprehensive advancements in supervisors' professional ethics, academic proficiency, and mentoring competence while requiring institutions to optimize structural composition, refine evaluation mechanisms, strengthen training and development initiatives, promote team building, and adapt to digitalization and AI-driven trends to address contemporary challenges. By confronting existing issues in supervisor team development, effective pathways and strategies can be explored in three dimensions: inheritance, innovation, and leadership.

3.1 Inheritance: Championing the educator spirit to fortify educational foundations

3.1.1 Deepening ideological education for supervisors

The state should establish an educator spirit repository, integrating pedagogical philosophies of pioneers such as Cai Yuanpei and Tao Xingzhi, alongside patriotic scientific exemplars such as Qian Xuesen and Huang Danian, into supervisor training curricula. Higher education institutions must organize annual thematic seminars featuring authoritative experts to explore innovative applications of the educator spirit in contemporary graduate education. These sessions should dissect renowned educators' mentoring philosophies and current policies, guiding supervisors to internalize the ethos' modern significance.

3.1.2 Strengthening ethical traditions and professional conduct

Launch annual Graduate Education Traditions initiatives—hosting forums where veteran supervisors share experiences—to perpetuate legacies of rigorous scholarship, truth-seeking pragmatism, and pioneering innovation. Develop forward-looking ethical standards aligned with technological and societal demands. An early warning system for ethical violations with one-vote veto authority should be implemented, whereas exemplary conduct should be concurrently publicized through Model Ethics Mentor campaigns to inspire emulation.

3.1.3 Establishing exemplary role models

Conduct rigorous annual selections of outstanding supervisors/teams on the basis of multidimensional criteria: ethical integrity, educational impact, research excellence, and societal contribution. Amplify their achievements via university portals, official WeChat accounts, and Douyin. The Institute Distinguished Supervisor Awards with monetary honors and priority in promotion/research funding to incentivize excellence across the supervisor community.

3.2 Innovation: Pioneering pathways to catalyze educational reform

3.2.1 Revolutionizing recruitment and structural optimization

To prevent demographic fractures, science-driven hiring criteria should be established that balance academic credentials, professional rank, teaching experience, and research output while ensuring intergenerational equity among junior, mid-career, and senior supervisors. Big-data analytics can be leveraged to implement discipline–capacity dynamic matching, prioritizing resource allocation to foundational, emerging, and strategically vital fields. Expand recruitment channels to integrate external

talent, operationalizing the dual-supervisor system (academic + industry mentors) through university-enterprise training bases—accelerating professional degree education advancement.

3.2.2 Reimagining evaluation and performance governance

The establishment of a multidimensional supervisor assessment framework will enable comprehensive evaluation across professional ethics, teaching quality, scholarly outputs, educational outcomes, and societal contributions. Annual assessments must tangibly link results to supervisors' performance bonuses, promotions, appointments, and student quotas, ensuring accountability functions as both incentives and constraints. Concurrently, competitive up-or-out mechanisms should be institutionalized to dynamically manage positions—restricting admissions rights for supervisors failing evaluations consecutively for two years with subsequent role reallocation. Furthermore, an explicit delineation of supervisory duties and rights is essential to prevent the institutional assignment of nonacademic tasks and the exploitation of students for personal errands, thereby safeguarding stakeholder rights.

3.2.3 Transforming training systems for holistic capacity building

A comprehensive supervisor training program must be developed, infused with the educator spirit and enriched across multiple dimensions: theoretical policies and ideological education; ethical conduct and mentoring standards; institutional norms and training requirements; academic innovation and integrity protocols; discipline-specific competency enhancement; research methodology and pedagogical praxis; digital technologies and curriculum development; and exemplary and cautionary case studies. This entails implementing holistic preservice training for newly appointed supervisors and tailoring advanced modules for experienced faculty. Adopting a blended synchronous-asynchronous format, online platforms provide autonomous learning resources in instructional strategies and research innovation techniques, whereas annual intensive workshops—featuring policymakers, distinguished scholars, and exemplary supervisors—will deliver specialized lectures to establish a cyclical training framework progressing from policy interpretation to skill advancement, experience sharing, and reflective improvement, thereby increasing holistic mentoring proficiency.

3.3 Leadership: Exemplifying excellence to propel educational advancement

3.3.1 Pioneering academic frontiers and scientific breakthroughs

Refine mechanisms for academic leadership by empowering influential supervisors to spearhead global scientific initiatives (e.g., Deep-time Digital Earth) and major technological projects. This position positions them to propose cutting-edge research agendas, advance scientific exploration, and strengthen national innovation sovereignty. Complement this with a robust scientist cultivation system: implement early-career supervisor development programs that increase support for junior faculty in national research projects through dedicated grants and startup funds. Encourage explorations in foundational studies, interdisciplinary frontiers, and strategic priority domains—particularly bottleneck technologies. Expanding global perspectives via international vision initiatives, facilitating research at world-class institutions and participating in premier academic conferences to increase scholarly excellence.

3.3.2 Leading Comprehensive Educational Reform for Exceptional Talent Cultivation

Traditional unidirectional instruction should be replaced with cross-disciplinary academic teams organized by colleges, disciplines, or research projects. Annual joint training programs select students with diverse academic backgrounds for cosupervision by faculty teams. Develop personalized training plans that align with students' interests, strengths, and career goals, enabling access to multidimensional mentorship and resources. Foster interdisciplinary collaboration where students assimilate varied research philosophies and methodologies across fields ^[15], dismantling disciplinary silos to cultivate globally minded innovators with social responsibility.

3.3.3 Shaping societal values through educational stewardship

Educational authorities and institutions must institutionalize the educator spirit through systemic innovation, reinforcing value-based leadership via the educator spirit in action initiatives that guide supervisors and graduate students toward societal engagement—including educational assistance (e.g., rural teaching, industry-academy poverty alleviation), tech-for-public-good programs (e.g., technical training, smart agriculture support), and cultural preservation (e.g., community science literacy campaigns, intangible heritage safeguarding). These initiatives deepen the understanding of societal

needs, cultivate service commitment and social responsibility, disseminate academic knowledge to the public, increase scientific-cultural literacy, and foster society-wide reverence for scholarships. Concurrently, universities should deepen the integration of industry and education through innovation, actively building research platforms. By establishing industry research institutes and technology transfer centers jointly with enterprises, they can promote close cooperation between mentors and enterprises, institutions, and research organizations. Together, they can conduct industry-academia-research-application research to solve "critical" technological problems accurately and build a new ecosystem for the integrated development of education, technology, and talent, providing intellectual and technological support for high-quality economic and social development.

4. Conclusion

The Educator Spirit is instrumental in the development of graduate supervisor teams. Through the synergistic advancement of three interconnected dimensions—inheritance, innovation, and leadership—we can comprehensively elevate the quality and mentoring expertise of supervisors, thereby propelling the high-quality development of graduate education. This strategic approach not only nurtures talents with a global perspective, innovative thinking, and social responsibility but also establishes a robust foundation of human capital for the nation's enduring advancement and prosperity.

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