

# Research on the Construction of High-level Postgraduate Tutors Team based on Reform of Scientific and Technological Management System

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**Abstract:** The postgraduate tutor is the key force of postgraduate training and the first responsible person of postgraduate training. The postgraduate tutor team is the key factor to ensure the quality of postgraduate education. In order to better respond to the challenges brought by the reform of the scientific and technological management system in the new era, grasp the opportunities brought by the new situation, analyze and sort out the current situation and problems of the college's tutor team, and explore the construction mechanism of high-level postgraduate supervisor team under the new situation.

**Keywords:** Reform of Scientific and Technological Management System; Graduate Tutor Team; Tutor Team Mechanism Construction.

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## 1. Introduction

A high-quality, high-level, and highly capable team of graduate supervisors plays an important role in improving the quality of graduate education. The issuance of documents such as the Opinions of the Central Committee of the Communist Party of China and the State Council on Comprehensively Deepening the Reform of Teacher Team Construction in the New Era and the Opinions on Fully Implementing the Responsibility of Cultivating Virtue and Talents for Graduate Supervisors further emphasizes the strategic significance of graduate supervisor team construction. In recent years [1], a few foreign countries have implemented technological blockades in some areas of China, making it the main responsibility of higher education institutions to cultivate high-end technical talents and high-level valuable technological achievements, especially in graduate education. In the face of the complex international situation and the current situation of the domestic scientific and technological system, the Education and Science and Technology [1] and [2] documents were released in 2020, which put forward several opinions on promoting the transformation and application of patent quality in higher education institutions and establishing a correct direction for evaluating scientific and technological achievements. Subsequently, several measures were released to eliminate the negative orientation of "paper only" in scientific and technological evaluation, and further clear provisions were made for the evaluation of high-level papers, the number of project award application papers, and the performance of paper awards. Under the new situation of technological system reform, it is even more urgent to improve the quality of graduate education in higher education institutions. On July 29, 2020, the National Conference on Graduate Education was held, which pointed out the need to strengthen the construction of the mentor team, strictly implement quality management and school culture, and guide the high-quality development of graduate education. It can be seen that implementing the responsibilities of mentors and establishing a team of highly moral and professional graduate supervisors is not only an urgent need for national education in the new

era, but also an inevitable requirement for strengthening the construction of the mentor team and improving the quality of graduate education.

Faced with the complex international situation and the current situation of the domestic scientific and technological system, the key points of the 14th Five Year Plan proposed strategic policies such as innovation driven and technological power building, and the reform of the scientific and technological system came with it. In order to better cope with the challenges brought by the reform of the technology system in the new era and seize the opportunities brought by the new situation, we propose a mechanism for building high-level graduate supervisor teams, explore the assessment and incentive mechanism for high-level landmark output oriented supervisor teams, and the stable and collaborative development mechanism for supervisor teams. We aim to create a group of high-quality and innovative graduate supervisor teams that have the ability to fight, dare to fight hard battles, and win in the field of scientific and technological innovation.

## 2. Problems in the Graduate Supervisor Team

### 2.1. Under the New Situation, The Evaluation and Assessment System for Graduate Supervisors is not Perfect

Since 2018, the Ministry of Education has successively issued documents such as "Opinions on Fully Implementing the Responsibility of Cultivating Virtue and Talents for Graduate Supervisors", "Opinions on Accelerating the Reform and Development of Graduate Education in the New Era", and "Guidelines for the Guidance of Graduate Supervisors", which require the implementation of supervisors as the first person responsible for graduate education, strengthening the basic quality requirements of graduate supervisors, improving the evaluation and incentive mechanism for graduate supervisors, and incorporating political performance, teacher ethics, academic level, and guidance energy investment into the evaluation and assessment system for supervisors. Currently, the tendency of

focusing solely on academic papers and prioritizing quantity over quality is still prominent in the evaluation of scientific research in universities, which is not conducive to improving the research level of university teachers and hindering the construction of the mentor team.

## **2.2. The Knowledge System of Graduate Supervisors is Solidified, and Their Academic Innovation Ability is not Strong**

Compared with key universities, the faculty team is relatively weak, and the ability of teachers to connect with cutting-edge technologies in their respective fields, undertake major national key projects, and solve practical problems in enterprises is slightly inferior. The knowledge system is relatively rigid and cannot meet the needs of cultivating high-level technical talents in the new era. The academic innovation ability of graduate supervisors is an important driving force for the development of disciplines and scientific research. Without high-level scientific research abilities, it is difficult for supervisors to cultivate students with excellent academic levels. At present, some graduate supervisors lack enthusiasm, initiative, and innovation in academic research, mainly focusing on traditional teaching content and conducting research on cutting-edge topics, which directly affects the cultivation of graduate students' innovation ability.

## **2.3. The Graduate Supervisor Team has Obvious Utilitarianism and Insufficient Planning**

High level scientific research teams generally set national level scientific and technological awards, national level talent titles, and national level key and major projects as their overall goals. They overly consider factors such as the number of scientific and technological achievements, proof of school enterprise cooperation, and the status of the industry, often forgetting the value of scientific research itself; The general goal of a research team is to complete a mentor's phased project, and the number of achievements, final reports, or project summaries often become the ultimate task. Except for research teams led by academicians, outstanding young scholars/Changjiang scholars, some research teams are formed with the goal of completing a single project. After the project is completed, the team disbands, which is particularly evident in local universities. Temporary topics lack depth and characteristics in the cultivation of graduate students, which is not conducive to the formation of knowledge systems and the in-depth exploration of scientific and technological innovation capabilities.

## **2.4. Insufficient Understanding of Graduate Supervisors in Serving Discipline Construction**

Graduate supervisors are the main force in the construction of disciplines in universities, and their research, teaching, and knowledge abilities directly affect the level of scientific research and education in the school. Discipline serves as a platform for the construction of the mentor team, and mentors lay the foundation for discipline construction. Both sides complement each other, promote each other, continuously enhance the innovation and competitiveness of the mentor team, and continuously create new prospects for the development of the discipline [2] [3]. However, due to

insufficient understanding or motivation of some mentors in the construction of service disciplines, they do not pay attention to service discipline issues and have long relied on individual efforts alone; At the same time, there is also an unreasonable mechanism where the assessment of teacher positions and the evaluation of professional titles do not reflect the energy investment of mentors in serving the discipline. The phenomenon of insufficient or insufficient positive incentive measures still exists, which has a negative impact on the development of the discipline and the construction of mentors serving the discipline.

## **3. Basic Ideas for Building a Team of Graduate Supervisors**

The college attaches great importance to the construction of professional ethics and competence of graduate supervisors, adheres to the guidance of party building, innovates work measures, and focuses on improving the ideological and political quality and professional ethics of the supervisor team. Organize the implementation of the "Team Leader Cultivation Plan", taking into account factors such as teacher ethics, academic vision, and professional abilities, to select a group of mentor team leaders and fully leverage their role as "mentors". Based on the "Team Leader Cultivation Plan", the team leader regularly analyzes and summarizes the personalized development needs of teachers in the mentor team, gradually optimizes the long-term development plan and assessment mechanism of the mentor team, and explores the establishment of a collaborative mechanism between internal personnel of the graduate mentor team and different research teams; Continuously implement the National Natural Science Foundation of China's cultivation program, with "quality, contribution, and performance" as the evaluation orientation, establish a research project and landmark achievement cultivation program with disciplinary responsibility for team members, and supervise the improvement of team teachers' theoretical problem extraction and scientific and technological research capabilities; Establish a two-way interaction mechanism with enterprises based on professional needs. Implement the "one person, two positions" plan, focusing on improving the industrial practice and social service capabilities of teachers. Revise and improve the appointment method for part-time graduate supervisors, select well-known experts and outstanding enterprise technical personnel in the same field as part-time supervisors, and optimize the structure of the graduate supervisor team in real time.

### **3.1. Reform the Mentor Evaluation and Assessment Mechanism to Enhance Innovative Thinking Abilities**

The goal positioning and development characteristics of different disciplines cannot be measured with a single ruler. In the context of breaking the "Five Only" system, the classification and guidance of teacher and student assessment, policy systems, indicator methods, etc. are comprehensively considered, and the quality of graduate education is regarded as the most core indicator of mentor evaluation and assessment [4], with a focus on cultivating innovative thinking and scientific literacy of graduate students. From multiple perspectives such as subject selection, indicator design, application of results, and construction of incentive and supervision mechanisms, we focus on the optimization

and improvement of the evaluation system and mechanism for graduate supervisors. This provides institutional guarantees and support for graduate supervisors to fully play their role as the first responsible person for moral education, thereby cultivating more graduate students who meet the requirements of the new era and promoting the high-level development of talent cultivation quality in universities. Build a responsibility evaluation system for graduate supervisors with "ideological and political, academic, teaching, and service" as the core. Establish a dynamic evaluation and appointment management mechanism for mentors, and implement a hierarchical and multi-dimensional evaluation system that combines self-evaluation by the supervisory department, the faculty committee, graduate students, and mentors.

### **3.2. High Level Mentor Team Leader Guidance and Management System Construction**

There are relatively few research teams formed by local engineering colleges, and most of the mentors' research is in a state of solo or temporary combination. New doctoral students have a strong passion for research but lack clear development plans. There is an urgent need to introduce or cultivate a group of morally upright, broad minded, broad vision, strong academic ability, and team leaders. Based on the principles of moral education and ideological and political education by the Ministry of Education, and with reference to moral character and academic ability, the selection of the leader of the characteristic mentor team is determined through individual application, team discussions, college professor committee discussions, internal and external expert discussions, teacher representative surveys and discussions, and party government joint meetings. Consider the personal development assessment needs of team leaders and gradually establish and improve the management system for mentor team leaders.

### **3.3. High Level Landmark Achievement Oriented Mentor Team Assessment and Incentive Mechanism Construction**

Under the guidance of national policies such as innovation driven and technological powerhouse, the reform of the "four only" technology evaluation system is unstoppable, and the utilitarian scientific research achievement orientation is gone forever. Refining direction, developing together, and cooperating deeply with enterprises to achieve in-depth integration of theoretical research and industrial practice is the main theme of future scientific research team development. Utilize the policy advantages of the institution as an entity, guided by high-level landmark achievements, and establish a long-term development planning and assessment mechanism for the mentor team; Analyze and summarize the personalized development and living needs of teachers in the mentor team, and gradually improve the incentive mechanism for teachers and students based on the mentor team. The college has successively issued documents such as the "Funding Measures for Important Achievements in Discipline and Professional Construction of the School of Transportation and Vehicle Engineering", the "Implementation Plan for Science and Technology Award Cultivation Team of the School of Transportation and Vehicle Engineering", the "Interim Measures for Strengthening the Implementation of"

Talent Engineering "by the School of Transportation and Vehicle Engineering", and the "Implementation Measures for Professional and Technical Position Assessment of Teachers in the School of Transportation and Vehicle Engineering", fully mobilizing the teaching and research enthusiasm of the college faculty and the enthusiasm for talent team construction, encouraging the output of high-level teaching and research achievements, and the introduction and training of academic leaders and backbone, providing strong support for discipline and professional construction and talent cultivation. Taking advantage of the institutional policy of being a physical entity, we adopt methods such as team assessment, team rewards, sharing of college resources, and guiding allocation of team interests to ensure the long-term, stable, and healthy development of the mentor team.

### **3.4. Exploration of Stable Collaborative Mechanisms among Mentor Teams**

In the process of building a graduate supervisor team, research tasks are characterized by creativity, high risk, and long-term nature. Team members have needs for livelihood and personal growth, and a relatively complete internal cooperation mechanism needs to be established to achieve sustained and healthy development of the team; In terms of graduate student sources, platform resource allocation, and enterprise cooperation resources, there is inevitably a competitive relationship between teams, and it is necessary to establish a collaborative mechanism between teams. In order to achieve mutual assistance and healthy competition within and outside the team, explore the establishment of a stable collaborative mechanism among personnel and teams within the graduate supervisor team, and achieve the goal of long-lasting achievements in supervisor team building. To ensure the healthy operation of the innovation team, the college will consider the new situation of technological system reform and the existing team advantages, establish a long-term, medium-term, and short-term cultivation plan for high-level achievements at the college level, and improve the assessment and incentive methods for the mentor team on the basis of the existing teacher assessment and incentive mechanism; To further standardize the management mode of each team and enhance cohesion, the college will consider factors such as the personal development needs of teachers and the contribution of teachers in the team, establish and improve the college's resource sharing mechanism, form a guiding method for team benefit distribution, and improve the stable collaborative mechanism within and between the mentor team.

### **3.5. The Construction of the Mentor Team Should be Guided by the Disciplinary Development Plan**

The construction of the mentor team is the core content of discipline construction. As a basic construction of the school's development strategy, discipline construction mainly plans the overall educational ideas and optimizes resource allocation at the school level based on the educational goals; At the college level, the main focus is on refining disciplinary directions, building a teaching team, building academic platforms, conducting scientific research, and cultivating high-level talents [3]. Guided by the development goals of the discipline, we aim to strive for research projects, apply for degree authorization points, build a talent pool, and produce more academic achievements, gradually forming a stable

research direction. The discipline builds a platform for the construction of the mentor team, consolidates research directions, and cultivates discipline leaders. Through the construction of a sound mechanism for mentor selection, evaluation, training, and management, we strive to build a mentor team with sufficient quantity, reasonable structure, strong scientific research capabilities, and vitality.

## 4. Conclusion

The construction of graduate supervisor team not only plays a decisive role in graduate education, but also has special significance in promoting the deepening reform and innovation of graduate training mechanism and the construction of graduate supervisor team for various challenges faced by current graduate education. From a deeper perspective, it has a profound impact on the cultivation and construction of innovative talents and the enhancement of graduate education's ability to participate in international competition. In this regard, this article explores the solutions to strengthen the construction of the graduate supervisor team from the aspects of reforming the supervisor evaluation and assessment mechanism, guiding the cultivation of supervisor team leaders, stable and collaborative cooperation mechanism of supervisor team, and building a supervisor team guided by disciplinary development planning, which can help improve the quality of graduate training. Through the implementation of a series of measures to enhance the comprehensive abilities of teachers, the guidance ability of graduate supervisors has been enhanced, which has helped to improve the quality of graduate education. In the past three years, the college has won 7 provincial excellent graduate supervisors and 1 excellent guidance team.

At present, China is in a period of rapid development in graduate education. Therefore, establishing and improving a high-quality graduate supervisor team is of great significance for cultivating high-level talents in the new era. Although the construction of the graduate supervisor team is a long and arduous task, we firmly believe that with the further improvement and standardization of graduate education and social changes, significant results will be achieved in the

construction of the graduate supervisor team.

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