

Exploration of Building an Interdisciplinary Graduate Supervisor Team

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Abstract

With the deepening of the structural reform of the supply side of education, the quality and efficiency of higher education have become the focus of social attention. It has become imperative for higher education to adapt to social needs and to cultivate graduate students with innovative ability and interdisciplinary background. In the context of reform, the traditional model of discipline-specific tutors has disciplinary limitations and cannot meet the cultivation needs of interdisciplinary graduate students, so the construction of

interdisciplinary graduate student tutor teams has become an important initiative to improve the quality of graduate student cultivation and innovation ability. In this paper, we will explore the disadvantages of the single system of postgraduate tutors in the context of the structural reform of the supply side of education, and explore the necessity of the construction of interdisciplinary postgraduate tutor teams and better strategies and methods to cultivate high-quality talents to meet the needs of the new era of a strong education country.

Keywords: Structural reform of the supply side of education, Interdisciplinarity, Postgraduate supervisor, Team building

1. Introduction

Structural reform of the supply side of education refers to a series of reform measures oriented to meet the people's demand for quality education. They can improve the quality and effectiveness of education and promote the fair and sustainable development of education by reforming the structure of the supply side of education. Yafen (2022) also mentioned that the structural reform of the supply side of education promoted the improvement of the education level by integrating and optimising the resources and solving the balance between the supply and demand of education. Its main goal is to optimise the allocation of educational resources, improve the quality and effectiveness of education and promote fair and sustainable development of education (Wei, 2022). The main contents of the structural reform of the supply side of education include: optimising the allocation of educational resources, strengthening the construction of educational infrastructure and improving the efficiency of the use of educational resources; promoting education and teaching reform, strengthening the construction of the teaching force and improving the quality of education and teaching; Strengthening vocational education and skills training and improving the quality and effectiveness of talent training; promoting the construction of education informatisation and improving the level of education informatisation and service capacity; Strengthening education evaluation and supervision, establishing a sound education quality monitoring and evaluation system, and strengthening education supervision and accountability (Lijuan, 2017). Structural reform of the supply side of education is one of the important directions of China's education reform, which is of great significance for improving the quality and effectiveness of education and promoting the fair and sustainable development of education. In this context, it has become imperative for higher education to adapt to the needs of society and to cultivate postgraduates with innovative ability and interdisciplinary background. However, the traditional model of postgraduate supervisors has disciplinary limitations and can not meet the cultivation needs of interdisciplinary postgraduates. Therefore, the construction of interdisciplinary postgraduate supervisory team has become an important measure to improve the quality of postgraduate training and innovation ability.

1.1 The Disadvantages of the Single System of Postgraduate Supervisors in the Context of the Structural Reform of the Supply Side of Education

With the continuous expansion of postgraduate education in China, the postgraduate team in China has become increasingly large. Statistics show that the number of postgraduates in China has increased far more than the number of postgraduate tutors, and the ratio of

postgraduates to tutors is seriously out of proportion. Postgraduate training and education is the top priority of China's education system, but also the main way to cultivate high-level professionals (Ministry of Education of the People's Republic of China, 2018). In China's postgraduate education and training most colleges and universities use a single tutor system, that is, the tutor one-to-one guidance, the tutor is the first person responsible for the training of postgraduate students. Mentors shoulder the responsibility of guiding graduate students to the frontiers of science, guiding the methods of scientific research techniques and teaching academic norms (Ministry of Education of the People's Republic of China, 2019). In any field, the mentor has an important key role in the early stage of the student's academic career, and a mentor with good morals and conduct is more likely to help students grow up and reap success.

In recent years, with the expansion of enrollment, a single mentor to guide the model of the drawbacks are becoming more and more prominent. The phenomenon of one instructor guiding several or even a dozen students in some majors in China where there is a lack of faculty members. If too many students are supervised, there will be problems such as the mentor being a virtual dummy, and there will be an imbalance between attending classes, researching and supervising students, which will eventually lead to the students graduating in a loose condition (Qianlong et al., 2022). The problem of graduate students and tutors is becoming more and more obvious.

The current problems of graduate student tutoring system include:

- (1) Unbalanced tutor resources: due to the single system of graduate student tutors, it leads to a relative abundance of tutor resources in some high-level universities but a relative lack of tutor resources in some ordinary colleges and universities. This also leads to differences in the quality and quantity of postgraduate supervisors, hence the quality of postgraduate training in different schools is not balanced.
- (2) Single supervisory style of supervisors: since postgraduates can only choose one supervisor to supervise them, it causes that postgraduates can only accept the guidance and influence of one supervisor, which easily leads to postgraduates' thinking style and research direction being limited. This is not conducive to the cultivation of diversified thinking and innovation ability of postgraduates.
- (3) Over-dependence of Postgraduates: postgraduates conduct research under the guidance of supervisors, but some postgraduates are over-dependent on supervisors, which leads to postgraduates' lack of independent thinking and innovation ability. At the same time, it is also likely to have academic misconducts.
- (4) Inadequate evaluation system of supervisors: the current evaluation of supervisors is mainly based on scientific research results, ignoring the evaluation of the quality of postgraduate training. This leads to some tutors focusing too much on scientific research and neglecting the cultivation of postgraduates' academic ability, innovation ability and comprehensive quality.
- (5) Postgraduate tutors are overburdened with work: due to the existence of the

postgraduate tutor system, some tutors need to supervise several postgraduates at the same time, which leads to the excessive workload of tutors and affects the quality of guidance for postgraduates.

To sum up, the single system of postgraduate tutors has many drawbacks in the context of structural reform of the supply side of education. It is necessary to make up for its shortcomings through interdisciplinary postgraduate tutor team building and other measures to improve the quality of postgraduates' cultivation and innovation ability (Beinum et al., 2024).

1.2 The Necessity and Urgency of Building Interdisciplinary Graduate Student Supervisory Teams

Interdisciplinary Graduate Student Supervisory Team is a team of supervisors with different disciplinary backgrounds, aiming to provide interdisciplinary guidance and support for graduate students (Chaoxia, 2024; Ruxue, 2024).

The significance of this kind of team is the following:

- (1) Providing multidisciplinary perspectives: interdisciplinary postgraduate supervisory team can provide postgraduates with professional knowledge and perspectives of different disciplinary fields, and help postgraduates think about the problems from multiple perspectives and broaden their research ideas (Lingyan, 2022).
- (2) Promoting cross-fertilization of disciplines: interdisciplinary postgraduate supervisory team can promote exchanges and cooperation between different disciplines, promote cross-fertilisation of disciplines, and cultivate research talents with interdisciplinary background.
- (3) Provide comprehensive guidance: interdisciplinary graduate supervisory team can provide comprehensive guidance for graduate students and help them make more comprehensive and accurate decisions in research design, experimental methods, data analysis, etc.
- (4) Cultivate teamwork ability: interdisciplinary graduate supervisory team can cultivate graduate students' teamwork ability, so that they can learn to cooperate with people from different disciplinary backgrounds and improve their ability to solve complex problems (Matthew & Jeni, 2022).

In conclusion, the concept and significance of interdisciplinary postgraduate supervisory team is to provide postgraduates with multidisciplinary perspectives, promote interdisciplinary cross-fertilisation, provide comprehensive guidance and cultivate teamwork ability, so as to cultivate research talents with interdisciplinary backgrounds (Baoqiang et al., 2024; Ramachandran et al., 2022).

With the development of science and technology, the intersection and penetration of disciplines, the emergence of new disciplines and the emergence of increasingly close links between disciplines, we need to find the intersection of various disciplines to achieve

interdisciplinary collision and integration in order to continue to stimulate and refine new ideas and new issues and to be able to further put forward a new point of view and new theories. This also requires graduate student supervisors to have multidisciplinary knowledge. Zhao (2023) mentioned that the multidisciplinary interdisciplinary postgraduate collaborative training mode helps to break through disciplinary barriers, eliminate professional boundaries, strengthen the construction of interdisciplinary curriculum system and cultivate high-level composite professionals with cross-field and multidisciplinary cross-competencies to cope with the needs of major national tasks. In the face of the expansion of the scale of postgraduate students and the diversification of the individual needs of postgraduates, which requires tutors to teach according to their abilities. These requirements bring difficulties and challenges to the traditional tutorial system. Also, due to the unity of the academic inheritance relationship, it is easy to cause the graduate students' academic horizons are not broad, so that the students are prone to form the academic gateway opinion, suppressing the students' academic innovation.

Due to the unevenness of China's postgraduate supervisory team in terms of moral quality, academic knowledge and the lack of adequate academic exchanges owing to the single supervisory system, it very likely to make the poor quality training of postgraduates. This can not be well adapted to the trend of the development of interdisciplinary cross-fertilization. For this reason, we need to build interdisciplinary teams of graduate student supervisors and effectively utilize the role of graduate student supervisors by clarifying their roles and responsibilities in the process of graduate student training and adopting effective measures to implement them. Through the construction of interdisciplinary postgraduate supervisory team, postgraduates can learn from the supervisors of different disciplines from different disciplines of theoretical knowledge, research ideas, and methodology, technical operation and other cutting-edge knowledge, which is more helpful to cultivate postgraduates' innovative thinking (Löfqvist et al., 2024).

2 Strategic Approaches to Interdisciplinary Graduate Student Supervisory Team Construction

2.1 Building a Quality Selection Mechanism for Interdisciplinary Postgraduate Supervisory Team

The formation of tutors should select tutors with different disciplinary backgrounds and professional knowledge to ensure the team's disciplinary coverage and professional competence, promote interdisciplinary cross-research of postgraduates, and optimize the allocation of tutor resources. Team members should include experts and scholars in different disciplinary fields. What is more needed for a good team building is a quality and perfect selection mechanism. In the selection process, all aspects of the tutors must be checked at all levels in strict accordance with the standard requirements. In addition to making relevant regulations on the basic conditions of selection, such as age, education, profession, academic and scientific research achievements, etc., it is also necessary to pay attention to the development potential of the prospective tutors as well as optimising the structure of the existing tutors. In determining the new postgraduate supervisors of disciplines, it should be

based on the actual needs of discipline construction and postgraduate training. Ensure the quality of selection, so that tutors are clear about their responsibilities that they need to guide students to master advanced knowledge and technology, improve the students' self-integrated quality to set up a precise values outlook and cultivate high-quality talents to make the tutor's resources optimised allocation. Therefore, it can be seen that the selection of tutors must be strict, flexible and regular.

2.2 Clear the Roles and Responsibilities of Interdisciplinary Graduate Student Tutor Team

The roles of the interdisciplinary mentor team should include a lead mentor, a subject specialist, a technical expert and a data analyst, etc. The leading teacher is the professor or associate professor who has the qualification of postgraduate enrollment and has excellent political and moral qualities, as well as deep academic attainments and guidance ability in the field of the specific discipline. They are also the leaders of the whole team, responsible for the overall planning, organisation and management of the project. They are usually the main person in charge of the project and are responsible for the design, implementation and supervision of the project, as well as co-operating with other team members to ensure the smooth running of the project (Aishwarya et al., 2024). Discipline Specialists are professionals on the team who have in-depth knowledge and expertise in a specific discipline. They are responsible for providing subject matter expertise and guidance, providing academic support for the project, and working with other team members to ensure the academic quality and accuracy of the project. Technical Specialists are technicians on the team who have expertise and skills in specific technical areas. They are responsible for providing technical support and solutions, providing technical guidance for project implementation and data analysis, and working with other team members to ensure the technical feasibility and effectiveness of the project. Data Analysts are the data experts on the team who are responsible for collecting, collating and analysing the data required for the project. They use statistical and analytical methods to interpret data and provide data-driven decision support for projects. They work with other team members to ensure the accuracy and reliability of the project's data analysis and interpretation. A clear division of roles is of great significance to supervisors in guiding graduate students, it can improve work efficiency, optimise resource allocation, and promote the development of graduate students' autonomy, diversified thinking and innovation ability, as well as safeguarding academic ethics (Pengjun, 2023).

2.3 Building a Comprehensive Interdisciplinary Postgraduate Supervisory Team Training System

Organise special training courses for tutors, including the concept of postgraduate training, guidance methods, academic ethics and other aspects. The training can be carried out by schools, academic institutions or professional tutor teams, through lectures, seminars, workshops and other forms. Continuous development of education and training, such as pre-service training, induction training, and on-the-job training and regular scientific research training, is implemented for the teachers of the tutor team. Teachers' ideological and political training can be strengthened to enhance the mentors' ideological awareness and professional ethical sentiments. Strengthen the professional quality training of the tutor team, encourage

academic exchanges and seminars, and actively participate in teaching management, etc., so as to absorb the frontier knowledge of the profession and improve the professional quality. Encourage interaction and experience sharing among tutors through communication and cooperation. Regular tutor symposiums, seminars and other activities can be organized to allow tutors to learn from each other, exchange tutoring lessons and educational methods, and improve their own interdisciplinary research ability and tutoring level. Provide opportunities for tutors to practice and exercise, such as participating in scientific research projects, guiding students to participate in academic competitions and organising academic activities. Through practical exercises, tutors can improve their own academic level and guidance ability, and provide better guidance and support for graduate students. Strengthening the training of teacher management system, interpreting national laws, regulations and policies, and training on the rules and regulations related to enrollment selection, cultivation, degree conferment, as well as the selection of supervisors of the university faculties and departments, so as to help the supervisors to clarify their cultivation objectives (Horne et al., 2024). A comprehensive interdisciplinary postgraduate tutor team training system will improve the overall quality and level of the tutor team. At the same time, it can also provide better guidance and support for graduate students and promote their overall development (Alberto et al., 2023).

2.4 Establishing a Perfect Reward and Punishment Mechanism for Interdisciplinary Tutor Teams

An effective incentive mechanism can make tutors clear about their goals, better restrain their own behaviour, and stimulate their innovation and scientific research ability to the fullest extent, so as to improve and ensure the quality of the whole team. The incentive mechanism can be designed in different forms and contents for different situations, and the forms and contents can be diversified as much as possible. For tutors with outstanding performance in interdisciplinary postgraduate training, rewards can be given, such as academic honours, prizes, academic resources, and so on. This can motivate tutors to actively participate in the cultivation of interdisciplinary postgraduates and improve the enthusiasm and quality of their work. Establish a set of scientific and effective tutor assessment mechanism to assess and recognise the tutors' supervisory ability. The assessment results can be used as a basis for rewards and punishments, and tutors with excellent assessment results can be rewarded, while tutors with poor assessment results can be punished accordingly by reducing research resources and limiting the number of students to be supervised. Supervisors are encouraged to have regular interaction and communication with students in order to understand their needs and difficulties in time and provide targeted guidance and support. Rewards, such as commendations and bonuses, can be given to mentors who actively participate in student training and establish good relationships with students. A special tutor incentive fund which is set up to reward outstanding tutors and support tutors' interdisciplinary postgraduate training work can provide more resources and support to motivate tutors to actively participate in the training of interdisciplinary graduate students. A set of perfect reward and punishment mechanism for interdisciplinary graduate student supervisory team can motivate supervisors to actively participate in the cultivation of interdisciplinary graduate students and improve the quality and level of supervisory team. At the same time, it can also penalize the bad behavior

of tutors and ensure the quality of training and academic ethics of interdisciplinary graduate students (Reisman et al., 2022).

3. Discussion and Conclusion

In conclusion, in the context of the structural reform of the supply side of education, the single tutor system can no longer meet the needs of socio-economic and educational development in the new era, and the construction of interdisciplinary postgraduate tutor team is extremely urgent for the current postgraduate education, and it is an important initiative of the structural reform of the supply side of education. Optimising the allocation of tutor resources and building a high-quality interdisciplinary postgraduate tutor team makes it possible to improve the team's innovation ability, create a high-quality, high-standard, high-level interdisciplinary tutor team, improve the quality of postgraduates' cultivation and innovation ability, and improve the quality of talent cultivation, so as to satisfy the needs of the new era of education and economic and social development of the country and the demand for talents. To this end, colleges and universities should formulate relevant policies to encourage interdisciplinary cooperation among tutors, establish interdisciplinary postgraduate tutor teams to provide all-round guidance and support through teamwork; and strengthen tutor training to improve tutors' interdisciplinary research ability. It is hoped that this paper can provide certain reference and inspiration for colleges and universities to improve the quality of postgraduate training and innovation ability.

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Authors Contributions

Prof. Hanqing Tang and Songyi Mo were responsible for study design and revising. Jiahui Li drafted the manuscript and Shumin Zhang revised it. All authors read and approved the final manuscript. Jiahui Li and Shumin Zhang contributed equally to the study.

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