

Innovation Oriented Team Construction of Graduate Students

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Abstract. The training of innovative graduate talents is the objective requirement of modern society development, international economic competition and national talent cultivation. The cultivation of graduates' innovative ability needs to strengthen the construction of graduates' scientific research team. This paper analyzes the connotation and characteristics of graduate student innovation team, and introduces the typical operation mode and practice of graduate student innovation team. Aiming at the main problems of team building, this paper puts forward some countermeasures and suggestions on building a first-class graduate innovation team.

Introduction

Since twenty-first Century, all countries in the world have realized that the key to national competition is talent competition, and the key to enhance the comprehensive national strength is to improve the quality of high-level personnel training and strengthen the cultivation of innovative thinking and innovation ability. The Ministry of Education in 2003 implemented the "Graduate Education Innovation Program", in 2005 issued a "Several Opinions of the Ministry of Education on Implementing Graduate Education Innovation Program, Strengthening Cultivation of Innovative Ability of Graduate Students, and Further Improving Quality of Training", the core goal is to establish new mechanism of graduate innovation education, and to strengthen the cultivation of graduate students' innovative consciousness, innovative spirit and innovation ability. In recent years, with the implementation of the graduate education innovation program in China, the research and innovation team of graduate students with the characteristics of social collective cooperation has emerged. This is not only to point out the direction for the colleges and universities to take the road of open cooperation, and vigorously promote the collaborative innovation in the direction of international technology and technical progress of the industry and other fields, but also has important guiding significance for further deepening ideological connotations of innovative education for graduate students and exploring effective ways to cultivate the innovation ability of graduate students.

In the traditional mode of education, Chinese graduate students have a strong advantage in the memory ability and test ability, but have a certain gap in thinking, creating, cooperation and other aspects compared to graduate students of developed countries such as the United States. This is due to the education of our country is still based on the scholastic knowledge education, has the characteristic of long passive practice and light active practice, practical ability of graduate students is poor, the ability to engage in scientific research is weak, difficult to adapt to the ever-changing social science and technology, economy, and politics development. In addition, with the enrollment expansion of graduate students, the task of teaching and research is becoming more and more arduous, which also raised a new challenge for graduate training. In this context, it needs to transform the traditional graduate training model and to explore new ways of graduate education management has become the consensus of higher education administrators and scholars. It is one of the effective ways to build a new graduate education management model by constructing graduate student research and innovation team using the concept and theory of team, knowledge sharing and organizational learning.

The Connotation and Characteristics of Innovation Team

The concept of team learning has been paid more attention in the field of higher education in the west, many universities in the United States, Germany and Australia used the team training model in graduate education, and achieved a lot of results. In German, for example, different disciplines in many universities such as digital media specialty in University of Bremen, applied informatics specialty in University of Duisburg-Essen, information specialty in University of Konstanz, sociology in Düsseldorf University, media informatics in Weimar University and ecological agriculture in University of Kassel have formed graduate team education model based on project management [1]. In recent years, some colleges and universities in China rely on scientific research team to cultivate graduate students also made a useful exploration and practice. Institute of Population and Development in Xi'an Jiaotong University formed a study-oriented research team which foothold in international research platform and formatted on multi-disciplinary background, received a good effect [2]. From 2007, Intelligent Control Institute of College of Control Science and Engineering in Dalian University of Technology began to test graduate training mode based on research team. Through years of practice, a profound understanding of the scientific research team of graduate training model is conducive to improve graduates' innovation ability and comprehensive quality [3]. As well as Shandong University, Beijing University of Posts and Telecommunications, Beijing University of Aeronautics and Astronautics, Beijing Institute of Technology, Beijing Jiaotong University, etc., have adopted the graduate research team management model [4].

Thus, the research team has become an important mode of scientific research in Chinese higher education institutions, especially research universities. American scholar Chris Harris argues that the so-called innovation team, starting with innovative power and exploring creative processes, is a group of well-trained and creative people who carry out complex systems innovation activities [5]. The graduate research and innovation team, is the research groups which are graduate-centered, taking innovation as the goal, using academic exchanges as a link, having interdisciplinary characteristics, and basing on all types of science and technology innovation platform of the university.

Compared with the individual learning, team learning emphasizes the mutual communication between members, promote the realization of the team goals and improve the skills in the interaction; emphasizes the individual in the team is no longer passive acceptance of knowledge and skills, but to play their own strengths to actively seek the problem solving method; the role of teachers becomes collaborators in the students' learning. Graduate scientific research innovation team can comprehensively enhance the graduate students' innovative consciousness, practical ability, team concept and other comprehensive quality, broaden the horizons of scientific research and innovation, encourage and attract more graduate students to participate in scientific research and innovation, and create a good atmosphere for scientific research and innovation, thus promote the graduate better independent innovation learning, enhance their original innovation ability and independent entrepreneurial ability, cultivate a large number of high-level graduate students innovative talents.

Innovation is the core task and mission of the graduate innovation team. Its main features are as follows:

(1) Having common development goals. The formation of the innovation team is derived from the common aspirations and goals of the members, aiming at the scientific frontier hot issues and around the needs of the national development strategy. It needs to determine the team's scientific research field and development direction, to put forward the team's strategic development objectives, to formulate feasible construction tasks, and then through collective efforts to gradually promote the completion of the construction tasks and development goals.

(2) Having a leader. Team leader is the core of team formation and development, and is the decisive factor for the formation and stability of the team. The team leader must have considerable academic influence, to inspire and bring a group of excellent talents together to form the academic team; also must have a charisma in order to make the team to maintain unity, stability and cohesion.

(3) Having a research echelon with reasonable scale structure. The innovative team is usually composed of leaders, young and middle-aged academic backbone, young teachers and graduate students, and so on, forming a pyramid structure. A stable and efficient operation of the team should have a reasonable size, members shall form a reasonable structure in terms of age, title, education, professional and academic background, so that the team members can complement each other in knowledge and ability, and promote each other, and also easy to manage the team.

(4) Having a good academic atmosphere and norms. Good academic atmosphere and norms reflect the core values of the team. Advocating science, the pursuit of first-class development goals, team spirit of the team collaboration between members, attitude of learning that “everyone is equal in front of academic”, mutual trust and cohesion are the intrinsic motivation and spiritual pillar for the construction and development of the first-class innovation team.

Innovative Team Building Practice

Two team building models are used in the construction of graduate innovation team of our school of Computer Science.

The first is the mentor-driven model. The team is consisted of by the graduate students of a number of co-driven mentors. Mentors are closely related, their research directions are both synergy and personality. The mentors guide students to carry out academic activities in “mentor team” way, and coordinate the use of laboratory platform and other issues; in the mentors’ strong support, team members bold to carry out scientific exchanges and scientific exploration, to carry out basic research work and accumulate scientific research experience, such as embedded technology team.

The second is the project driven model. Relying on scientific research projects, through the analysis of the project, the project leader finds complementary members for the project, members play their respective professional advantages and technical expertise, to find a solution to the problem, and finally complete the research project. For example, phishing webpage detection project team is a project driven innovation team. The team was composed of five graduate students from school of Computer Science and Faculty of Humanities and Foreign Languages. During the course of the project, the team gave full play to the advantages of the complementary skills of the members, cultivated the cooperative spirit of team members, and improved problem-solving skills and practical ability. Funded project driven team is more likely to mobilize mood of the members, boldly carry out scientific research.

Summary

According to the analysis of theory and practice, it can be seen that the form of team learning has a good feasibility in the innovation education of graduate students. Successful team learning will play an active role in improving the innovation level of graduate students. However, in order to make team learning more successful, the following aspects need to be strengthened:

(1) Enhancing the coaching level of the mentor team

In the mode of team-based graduate education, the mentors play a key role in the process of creating a good team atmosphere. On the one hand, we must strive to create conditions to build a reasonable structure of talent echelon; on the other hand, to establish and implement the team responsible person system, give full play to the initiative and responsibility of the team leader, on this basis, fully mobilize the enthusiasm and creativity of the team members, implement and produce tangible results of the “leader+team” construction model through the empowerment and institutionalization. So that graduate mentors can improve their academic ability and accomplishment, they can also improve the ability of “taking the team” and “building the team”.

(2) Further improving the communication mechanism between mentors and graduate students

The regular exchange of information between mentors and graduate students is of great significance for the instructors to understand the learning and working status of graduate students and to clarify their research direction and improve the research ability of graduate students. However, many mentors are too busy with personal affairs to attend to their own research team. This will inevitably lead to the spirit of the team members becoming slack and lax, good team

atmosphere was destroyed. Therefore, through the joint efforts of both teachers and students, taking the team communication activities as a required course, so that graduate students can enhance academic ability and scientific research level in a strong academic atmosphere.

(3) Paying attention to the cultivation of the cultural atmosphere of graduate students

Good team culture can not only play a role in pooling team members, achieving the complementary structure of knowledge among members, but also enhancing mutual trust and support among team members, is an inexhaustible motive force to maintain the sustainable development of the excellent team. First of all, the team should set up a team leader, so that everyone can feel not only in the academic atmosphere but also in the presence of team atmosphere; In addition, the team should determine the stage goals to ensure that team members heading in the same direction, forming a strong team cohesion and centripetal force, enhancing the psychological sense of security of the team members in a strong team atmosphere, and thus improving the ability of scientific research.

(4) Strengthening academic exchanges and encouraging academic innovation

Innovative team should have a global vision, open mind and inclusive mentality. We must pay attention to the academic exchanges at home and abroad, and vigorously strengthen scientific research cooperation; at the same time, create academic atmosphere of respecting for science, devoting to study, daring to doubt and encouraging innovative, so that team members can continue to go beyond themselves and pursue first-class; adhere to the people-oriented concept, establish a mechanism of fair participation, cooperation and win-win, so that team members have a strong sense of belonging and identity, cultivate good spirit of cooperation, enhance team cohesion, maximize the mobilization and inspire the enthusiasm and creativity of team members.

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