

Exploration of the demand-oriented training model for professional degree postgraduates

-- Practice and thinking on the construction of graduate workstations

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Abstract: This paper takes the construction and operation of Jiangsu graduate workstations in the direction of materials science of Jiangsu University as an example, puts forward the innovative idea of demand-oriented school-enterprise “four-dimensional” co-construction mode, and establishes the operation and management mechanism of enterprise graduate workstations. Through the four dimensions of university-enterprise co-construction of tutor team, co-construction of project list, co-construction of innovation platform and co-construction of assessment system, explore the construction of professional degree graduate training mode, which provides experience for high-level talent training based on graduate workstations and the sustainable development of production-education integration.

Key words: professional degree; Postgraduate workstation; Integration of industry and education; Talent training; Operation management

On July 29, 2020, China held the first national postgraduate education conference since the founding of the People’s Republic of China, which has become a fundamental guideline for postgraduate education and training in the new era. In September, the Ministry of Education, National Development and Reform Commission and Ministry of Finance, three ministries and commissions jointly issued the “Opinions on Accelerating the Reform and Development of Graduate Education in the New Era”, which put forward the basic principles of “people-oriented, demand-oriented, innovation-led and reform-driven”. The development of professional postgraduate education plays a pivotal role in the high quality development of the economy and science and technology of the whole society. It can contribute to the construction of an innovative country, and is the crux and core of postgraduate education reform.

Since 1991, our country has been carrying out professional degree postgraduate education. Through the continuous exploration and attempts of government departments and universities, a high-level application-oriented professional personnel training framework with Chinese characteristics has been gradually formed, which has been repeatedly verified. In the process of spiraling improvement, we have also explored a professional master training mechanism with Chinese characteristics, which takes cultivating practical and innovative ability as the starting point and integrating production and education as the path. Jiangsu Province attaches great importance to the integration of industry and education. In 2021, the Provincial Education Department jointly with the provincial Degree Office issued the Implementation Plan of Jiangsu Graduate Education Quality Improvement Project (2021-2025), and put forward the “Promotion Plan for the integration of Science, Education, Industry and Education in Graduate Education” to continuously promote the construction of graduate workstations. A number of excellent graduate workstations and demonstration bases in Jiangsu Province are selected every year.

In recent years, under the guidance of the concept of deepening the integration of production and education, Jiangsu University has established a school-enterprise “four-dimensional co-construction” model of co-construction of tutor team, co-construction of project list, co-construction of innovation platform and co-construction of assessment system, and carried out the exploration and practice of the operation mode of enterprise graduate workstations and all-round talent training. Among them, on the basis of long-term industry-university-research cooperation with Jiangsu Tianchao Glass Co., LTD., in 2014, the application was approved as Jiangsu Province graduate workstation. After 6 years of construction and creation, it was recognized as Jiangsu Province excellent graduate workstation in the assessment of 2020, and successfully selected as Jiangsu Province excellent graduate workstation demonstration base in the following year 2021.

1. The concept and connotation of the school-enterprise “four dimensions” co-construction mode

The Academic Degrees Committee of The State Council and the Ministry of Education jointly issued the Development Plan for Professional Degree Postgraduate Education (2020-2025) in 2020. The plan points out that the inevitable choice for the economy and society to enter the stage of high-quality development is to develop professional degree postgraduate education, and emphasizes that it is also an important path for the construction of a service-oriented and innovative country. In today’s society, the division of labor is evolving in the direction of refinement and specialization, and the demand for talents is also evolving in the direction of diversification. Professional degree postgraduate education has gradually become the cornerstone of cultivating high-level innovative talents due to its characteristics of training practice and innovation ability. It is used to cultivate talents with solid theory and adapt to the needs of the industry, which is the same as the original intention of the establishment of graduate workstations.

The school-enterprise “four-dimensional” co-construction mode is mainly embodied in the four aspects of co-construction of mentor team, co-construction of project list, co-construction of innovation platform and co-construction of assessment system.

Co-construction of mentor team: the core of talent training is the need to have a sound “double mentor” team, the mentor team features both practical teaching theory, as well as a theoretical master of theory. Through such a team of tutors inside and outside the school, the communication channel between colleges and industries can be opened up. Colleges and universities hire industry mentors, relying on their

familiar technology frontier, into the training of professional master students in each link. At the same time, the university should invite the tutors to the enterprise for a period of not less than one year of experience, participate in the enterprise's research and development topics and projects, so as to make the research topics under their guidance more "down-to-earth", through talent exchange, strengthen the communication between tutors inside and outside the university. Both tutors should combine the industrial development and training objectives of professional master students, formulate training plans scientifically and improve training quality.

List of joint projects: Practice has proved that relying on the provincial graduate workstation, which is a platform for industry-university-research cooperation, it is the most perfect state to carry out talent co-education, project co-research and co-creation of results. At the same time, according to the requirements of the engineering professional Degree Teaching Committee, professional master students need to carry out professional practice in the enterprise industry for at least one year. This model relies on the research and development projects of graduate workstations, and sets up project lists according to the research and development needs of enterprises and the cultivation needs of students, and takes specific projects as the main carrier of graduate training to truly realize the effective integration of basic professional knowledge and professional technology.

Joint innovation platform: Compared with traditional engineering, "new engineering" puts more emphasis on the engineering education concept of interdisciplinary and industry-academic integration. The practice and innovation platform in the university is generally built on a single discipline platform, while the enterprise innovation platform is demand-oriented and set for product research and development, which is more interdisciplinary, which is conducive to the improvement of the enterprise's R&D ability. It is more conducive to the cultivation of innovative, composite and application-oriented professional degree graduates.

Joint assessment system: postgraduates have a strict assessment system on campus, but after entering the enterprise graduate workstation, almost out of the school management, the enterprise will enter the workstation graduate students as regular employees for daily management, daily assessment and performance assessment, and effectively connect with colleges and universities, the assessment results will be applied to the daily assessment of graduate students in colleges and universities.

2. The operation mechanism of graduate workstations under the "four-dimensional" co-construction mode of the university and enterprise

In order to ensure the benign operation of enterprise graduate workstations and practice the school-enterprise "four-dimensional" co-construction mode of research, production and education integration and joint training, both parties shall strictly follow the relevant provisions of the "Management Measures for Postgraduate Workstation Entry of Enterprises in Jiangsu Province" to manage the workstations, and jointly formulate the management and service system for postgraduate workstations. In the actual operation process of continuous system improvement and management innovation, so that the graduate workstation operation of the system, the degree of standardization has been constantly improved. Specific performance in the following aspects.

1. Clear division of labor: Under the guidance of Rules for the Implementation of Professional Practice Management of Full-time Professional Degree Postgraduates of Jiangsu University and Measures for the Implementation of Construction and Management of Joint Training Base for Postgraduates of Jiangsu University, colleges and enterprises should have clear division of labor and responsibilities. Universities and enterprises respectively assign special managers to be responsible for the daily management of workstations, college tutors are mainly responsible for academic guidance, and enterprise tutors are mainly responsible for practical guidance. Both sides jointly complete the training links including topic selection, stage discussion, defense and so on. The main leaders of the enterprise are responsible for the administrative service of the workstation, which provides strong guarantee for the training of postgraduates, including accommodation, catering, funds and so on.

2. Stable "double tutor" team: Each specific enterprise graduate workstation has a person in charge of the school, who has established a good foundation of industry-university-research cooperation with the enterprise, and set up a corresponding tutor team. Enterprise tutors are approved by the university after individual application according to the Interim Measures for the Appointment and Management of Off-campus Graduate Tutors of Jiangsu University. Tutors on campus and off-campus not only jointly guide graduate students, but also jointly apply for and complete scientific research projects. On this basis, a stable and interdisciplinary "double tutors" team is established.

3. Strict project management: Each year, before the topic selection of graduate students, the supervisor in charge of the university and the supervisor in charge of the enterprise workstation jointly agree to determine the project list. The project comes from the subject jointly undertaken by the two parties or the engineering and technical problems urgently needed to be solved in the enterprise technology research and development, aiming at the relevant scientific and technological frontier and key fields. The students complete the topic selection in the project list, and the enterprise supervisor will confirm the project. The pair relationship of "double tutors" is also determined.

4. Develop research platform: Universities and enterprises jointly apply for the national Enterprise Technology Center, provincial key laboratory, engineering technology research center and other research platforms through the in-depth "integration of industry and education", which not only provides funding guarantee for the joint training of graduate students by universities and enterprises, but also provides opportunities for graduate students to participate in projects facing the main economic battlefield and major national needs, and better practice of "writing papers on the land of the motherland". The original mission of "writing into the major instrument of a great country".

5. Improve the assessment mechanism: universities and enterprises are jointly responsible for the training of graduate students. Enterprise supervisors should regularly participate in the tutor training and rotation training organized by universities and get familiar with the training plan and graduation requirements.

3. The operation effect of graduate workstations under the “four dimensions” co-construction mode of the university and enterprise

On the basis of more than ten years of industry-university-research cooperation, Jiangsu University and Jiangsutieanchi Glass Co., Ltd. have carried out in-depth cooperation of “industry-university-research and application”, introducing enterprises into education, promoting education into enterprises, platform co-construction and talents co-education, forming a “think tank” support system with materials discipline as the center, mechanical engineering discipline, computer science discipline and chemistry discipline intersecting.

Facing the main battlefield of major national defense infrastructure construction of special safety glass, the two sides will jointly tackle the key issues of special safety glass in aviation, aircraft, high-speed rail transit and security fields with a demand-oriented approach. They have jointly undertaken and completed 7 provincial and ministerial scientific research projects, tackled 6 technological innovations, won 4 provincial and ministerial science and technology awards, and jointly built the National Enterprise Technology Center, Jiangsu Province Key Laboratory of Transparent Protection New Materials, Jiangsu Province Key Laboratory of High-end Structural materials and other research platforms. The two sides revised relevant management methods and established rules and regulations for workstation construction and joint training, further standardized and improved the system and mechanism, and encouraged the workstation to release more innovation energy. At the same time, a collaborative team of “double tutors” was formed to adhere to the fundamental task of cultivating talents by virtue, jointly tackle major engineering projects and key engineering and technical problems, and promote joint training and scientific and technological innovation of graduate students with projects as the link. Enterprise tutors were invited to enter the campus, the classroom and the laboratory with problems, so as to consolidate industrial frontier knowledge for graduate students. Send teachers and students regularly into the enterprise to carry out joint research and development, and guide the graduate students to write the thesis on the product, write into the Chinese Dream. The relevant education model has won the Jiangsu Provincial Teaching Achievement Award and the National Teaching Achievement Award, and has been selected into the advantageous discipline construction cases of Jiangsu colleges and universities.

4. Conclusion

Although the enterprise graduate workstation has made a lot of achievements in personnel training, scientific and technological innovation, practice platform and other aspects since its operation, breaking the barriers such as the disconnect between traditional graduate training theory and practice, and the instability of the double tutor team, during the operation of the workstation, There are also different degrees of contradictions such as enterprise technology research and development objectives and graduate training requirements do not match, the continuity of enterprise science and technology innovation and the frequent flow of graduate students in the future work will be further thinking and exploration, and constantly improve the management level of graduate workstations, promote the sustainable development of the integration of production and education.

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