



Research on the Training Mechanism of Excellent Engineers Based on School-enterprise Cooperation in the New Era

Yan Chang and Yunfei Xu*

State Grid Energy Research Institute Co. LTD, Changping, 102209, Beijing, China

*Corresponding author's e-mail: xuyunfei@sgeri.sgcc.com.cn

Abstract. In recent years, the State-owned Assets Supervision and Administration Commission and the Ministry of Education have successively issued a series of policy documents on strengthening school-enterprise cooperation and training outstanding engineers, and repeatedly stressed the need to speed up the training of outstanding engineers. However, at present, the outstanding engineer training mechanism based on school-enterprise cooperation is still in the exploratory stage, and state-owned enterprises urgently need to speed up the implementation of the national talent work deployment, study and introduce corresponding engineer training mechanisms, and improve the quality and efficiency of talent training. In this paper, the establishment of excellent engineer training mechanism through school-enterprise cooperation is studied, which promotes the implementation of excellent engineer training, constantly produces talents, mechanisms and results, and provides institutional guarantee for realizing the deep integration of Industry-University-Research and cultivating a large number of excellent engineers who support China's high-level scientific and technological self-reliance and high-quality development of manufacturing industry.

Keywords: Excellent Engineer, School-enterprise Collaborative Education, Training Mechanism.

1 Introduction

National development depends on talents, and national rejuvenation depends on talents. Strengthening the training of outstanding engineers is an important deployment for power grid enterprises to implement the strategy of strengthening the country with talents in the new era and build a national strategic talent force. It is also an inevitable requirement for power grid enterprises to coordinate the "two overall situations", grasp the strategic initiative, become stronger and better, and accelerate the construction of world-class enterprises. It is of great significance for power grid enterprises to fully implement the requirements of the party and the state on talent work, thoroughly implement the strategy of "strengthening enterprises with talents" and accelerate the construction of talent teams adapted to world-class enterprises [1].

© The Author(s) 2024

F. Zeng et al. (eds.), *Proceedings of the 2024 7th International Conference on Humanities Education and Social Sciences (ICHESS 2024)*, Advances in Social Science, Education and Humanities Research 887,

https://doi.org/10.2991/978-2-38476-323-8_51

The Central Talent Work Conference emphasized that it is necessary to train a large number of outstanding engineers as an important part of building a national strategic talent force and make a series of important instructions. The 20th National Congress of the Communist Party of China emphasized that it is necessary to speed up the construction of national strategic talents, and strive to cultivate more masters, strategic scientists, first-class scientific and technological leaders and innovative teams, young scientific and technological talents, outstanding engineers, great craftsmen and highly skilled talents. In recent years, the Central Organization Department, the State-owned Assets Supervision and Administration Commission and the Ministry of Education have successively issued a series of policy documents on strengthening school-enterprise cooperation and training outstanding engineers, and repeatedly stressed the need to speed up the training of outstanding engineers. However, at present, the excellent engineer training mechanism based on school-enterprise collaborative education is still in the exploration stage, and power grid enterprises urgently need to speed up the implementation of the national talent work deployment, establish and improve the engineer training mechanism, and improve the quality and efficiency of talent training [2].

To this end, this study actively conforms to the new situation of talent work, and makes in-depth research on the necessity, basic ideas and training mechanism of strengthening the training of outstanding engineers in the new period. Through the research and establishment of the training mechanism of outstanding engineers through school-enterprise cooperation, the training of outstanding engineers is promoted to be detailed, and talents, mechanisms and achievements are continuously produced, which provides institutional and institutional guarantee for realizing the deep integration of Industry-University-Research and training a large number of outstanding engineers who support China's high-level scientific and technological self-reliance and high-quality development of manufacturing industry. So as to provide theoretical guidance and method support for power grid enterprises to comprehensively deepen the practice of talent work and improve the training system of outstanding talents [3].

2 Importance of Strengthening the Training of Outstanding Engineers in the New Period

Outstanding engineers are a national strategic talent force and an important talent support to support high-level science and technology to stand on its own feet and achieve Chinese modernization. With the profound evolution of the new round of global scientific and technological and industrial changes, the "great change in a hundred years" continues to evolve, and the competition in the international scientific and technological field is becoming increasingly fierce. In September 2021, the Central Talent Work Conference pointed out that "it is necessary to explore the formation of a world-class engineer training system with China characteristics, and strive to build a team of engineers who love the party and serve the country, are dedicated and dedicated, have outstanding technological innovation capabilities, and are good at solving

complex engineering problems". On September 27, 2022, the Ministry of Education and the State-owned Assets Supervision and Administration Commission of the State Council jointly organized a promotion meeting on the training of outstanding engineers, and 18 construction units of the National Institute of Outstanding Engineers jointly issued the Beijing Declaration on the Training of Outstanding Engineers. In 2022, the Party's Report to the 20th CPC National Congress pointed out: "Accelerate the construction of national strategic talents, and strive to cultivate more masters, strategic scientists, first-class scientific and technological leaders and innovative teams, young scientific and technological talents, outstanding engineers, great country craftsmen and high-skilled talents." These strategic arrangements have pointed out the direction for China to speed up the training of outstanding engineers and improve the training system of outstanding engineers. At present, the training of outstanding engineers in China has a long way to go. The key to promote the training of outstanding engineers is the integration of Industry-University-Research and the coordination of education mechanisms. It is imperative to improve the training system of outstanding engineers in the new period.

Perfecting the training system of outstanding engineers is the need to support the innovation and development of the central government and build a world-class enterprise. Talent advantage is the most potential and reliable advantage. Building a world-class enterprise must rely on the support and guarantee of world-class top talents. At present, China's central enterprises in high-tech fields such as 5G, high-speed rail, aerospace, nuclear power and hydropower can enter the world's first echelon, which is inseparable from the outstanding contributions made by strategic scientists and outstanding engineers. The ability of scientific and technological innovation is an important symbol of building a world-class enterprise. Only by insisting on innovation-driven development, speeding up key core technology research, and bravely being the "source" of original technology and the "chain length" of modern industrial chain can central enterprises build more world-class enterprises. Outstanding engineers are all important national strategic talents, which have played an important role in promoting the implementation, incubation and landing of major scientific and technological projects and enhancing the core competitiveness of central enterprises [4].

Perfecting the training system of outstanding engineers is the need to innovate and optimize the system and mechanism of talent training and accelerate the construction of national strategic talent force.

Since entering the new era, the CPC Central Committee with Comrade Xi Jinping at its core regards "training a large number of outstanding engineers" as the important content of "accelerating the construction of national strategic talent force", and points out that it is necessary to explore the formation of a world-class engineer training system with China characteristics, which points out the direction and provides guidance for us to continuously deepen the reform of engineering science and technology personnel training and improve the quality of independent training of outstanding engineers. As the main position for training outstanding engineers, state-owned enterprises, especially central enterprises, should be mindful of "the leader of the country", improve their political stance, and deeply understand that accelerating the training of outstanding engineers is an inevitable requirement for coordinating the "two overall

situations", grasping the strategic initiative, developing and expanding the real economy, consolidating the economic foundation of a big country, and making the state-owned enterprises stronger and better, and actively exploring the road of training outstanding engineers with China characteristics and world level.

Power grid enterprises continue to improve the school-enterprise cooperation mechanism, promote all-round and in-depth cooperation between schools and enterprises around the talent training mode, and continue to strengthen integration in joint enrollment, joint curriculum development, tutor team construction, engineering practice, major project guidance, student management, ideological and political work, and achieve remarkable results. Relying on the platform of University Council and China Electricity Council, we will gradually build and improve the new mechanism and mode of school-enterprise cooperation, effectively realize the deep integration and collaborative linkage of Industry-University-Research, and initially build an engineering talent training system with distinctive characteristics, which will provide strong talent support for building an international leading energy Internet enterprise with China characteristics and realizing the great rejuvenation of the Chinese nation.

Therefore, power grid enterprises need to deepen the reform of personnel training system and mechanism, focus on Industry-University-Research's deep integration, optimize and improve the training mechanism for outstanding engineers, give full play to the advantages of central enterprises, fully provide resource support, carefully organize engineering practice, build the National College of Outstanding Engineers with high standards, and accelerate the training of a large number of outstanding engineers who support China's high-level scientific and technological self-reliance and high-quality development of manufacturing industry.

3 Research Progress on Training Outstanding Engineers

The research on the training of outstanding engineers in China is later than that in foreign countries, and it is still not perfect and has not yet formed a systematic research theoretical framework. Domestic scholars have studied the excellent engineer system from the current situation of engineer training, school-enterprise cooperation education mode and other fields and angles [5].

3.1 Research on the Training of Engineers

Regarding the present situation and problems of engineer training, Wu Qidi thinks that "the relationship between engineering education and industry is not close, and there are very few opportunities for students to participate in practice; And now the teachers engaged in engineering education in colleges and universities also seriously lack the experience of engineering practice. The curriculum design of many engineering education is out of touch with the demand, and the content is aging, divorced from reality and far from practice. Zhu Gaofeng believes that "there are problems in the quality of engineering education in China. First, the knowledge is outdated, and the majors and courses can't keep up with the pace of scientific and technological devel-

opment; Second, lack of ability. On the one hand, influenced by the American education system, some colleges and universities attach importance to light industry and neglect the cultivation of students' practical ability. On the other hand, because China's market mechanism is still immature, society and enterprises are driven by short-term interests, and students are not welcome to practice in the unit; The third is moral emptiness. Zhang Zhijun believes that "the existing training mode of higher engineering education is single, lacking diversity and adaptability; Lack of engineering and weak practical links; The evaluation system focuses on paper, ignores design and lacks practice; Insufficient attention and investment to students' innovative education; The cooperation between industry, university and government is not in place, and enterprises do not attach importance to the participation in the talent training process.

3.2 Research on School-enterprise Cooperation

There are many research results on school-enterprise cooperation, such as the research on school-enterprise cooperation mode: including enterprise cooperation mode, the school is responsible for almost all the tasks of talent training, and the enterprise is in the auxiliary position of cooperation; School-enterprise joint training mode, the school provides consulting, training and other services for enterprises, establishes a horizontal consortium, establishes a board of directors, and forms a diversified investment subject; School-enterprise entity cooperation mode, the school carries out project development according to the development needs of enterprises to help enterprises improve overall efficiency. Research on the logical relationship of school-enterprise cooperation "School-enterprise cooperation has its inherent logical relationship, that is, the supply and demand relationship of talents and the supply and demand relationship of information. Starting from the internal relationship, we should strive to start from the inherent needs of both sides, follow the inherent laws, promote the teaching process of colleges and universities to adapt to the production process of enterprises, and enterprises actively participate in cooperation, putting their own demand for talents in the training process, so as to obtain sustainable talent reserves and promote the sustainable development of their own production. In the research on the subjects related to school-enterprise cooperation, there are mainly five viewpoints: subject diversification, government subject, school subject, school-enterprise community and double subject. The study of double subject mainly puts forward that enterprises and schools are two subjects of school-enterprise cooperation, and the combination of the two is called double subject.

3.3 Research on The Role of Enterprises

There is little research on school-enterprise cooperation related to the role of enterprises. Zhang Jinhua analyzed four types: government-led, enterprise-led, school-enterprise cooperation and school-led, and put forward that the shareholding system is the most stable way of cooperation, but the research is from the perspective of enterprise management mechanism, not in the field of education. Wang Yani analyzed the role relationship in school-enterprise cooperation, and put forward that enterprises

should be the strong backing of vocational education. The expression was general and simple, and there was no specific analysis of roles. Wang Ye and Yuan Yuan discussed the role orientation of schools and enterprises in post practice, and put forward reform opinions on the docking of schools and enterprises. The main content is how schools and enterprises should cooperate with each other, without specifically discussing the role of enterprises. Shu Tingting, Chen Yue and Qian Liangliang put forward that software enterprises should play four roles in software engineering education, but the analysis of their roles is mainly aimed at the different roles of enterprises at different stages. Wu Ling analyzed the role and function of enterprises in the course construction of work-study combination, including five aspects: enterprise participation in the course system, practical course content, construction of double-qualified teachers, supervision and evaluation, and course research, and put forward measures to play the role of enterprises in the course construction of work-study combination, but the research was only aimed at the course construction.

4 Conclusion

Talent makes the nation prosperous, and talent makes the country strong. Outstanding engineers are an important part of the national strategic talent team, and are the central force of the first productivity of science and technology, the first resource of talents and the first driving force of innovation. General Secretary Xi Jinping pointed out at the Central Talent Work Conference that it is necessary to vigorously train and use strategic scientists and train a large number of outstanding engineers. Training outstanding engineers is an important part of speeding up the construction of national strategic talents. Innovating and perfecting the training system of outstanding engineers is a key measure to implement General Secretary Xi Jinping's directive spirit of speeding up the construction of national strategic talents and training a large number of outstanding engineers, which is of great significance for power grid enterprises to innovate and improve the personnel training system and mechanism, promote the "one body and four wings" high-quality development and accelerate the construction of world-class enterprises.

References

1. Liu, Y.Q., Han, S.J., & Bai, Q.Y.. The ability, quality and growth path of outstanding engineers-based on the portrait analysis of the objects commended by the National Engineer Award. *Science and Technology Herald* (17),7-15 (2024).
2. Zhong, B., &Ran, L.J.. School-enterprise joint "customized" training of graduate students majoring in mechanical engineering. *Education and Teaching Forum* (24),166-170 (2024).
3. Wu, H.M., & Li, F.. Excellent Engineer Training System with Deep Integration in Industry-University-Research. *Research on the Development of Science and Education* (04),1-19 (2023).
4. Wang, Y., Liu, J.C., & Zhao, Q.P.. Construction ideas and realization paths of excellent engineer training consortium. *China Higher Education Research* (11),26-31+38 (2023).

5. Lin, J.. Construction of National School of Excellence Engineers: All-round and in-depth cooperation between schools and enterprises to train high-level outstanding engineers. Research on Higher Engineering Education (05),7-17 (2023).

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

