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Research on the Training System Construction of Meteorological Higher Talents for Lifelong Education

Chengkun Xie[1*]

[1] College of Liberal Arts, Nanjing University of Information Science & Technology, Nanjing, Jiangsu, China

[*] Chengkun Xie, College of Liberal Arts, Nanjing University of Information Science & Technology, Nanjing, Jiangsu, China

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Abstract

Meteorological education and training is an important way for the growth of meteorological talents. Exploring and studying how to build a meteorological higher talent education and training system that meets the needs of lifelong education is of great significance to solve the talent guarantee for the sustainable development of meteorological undertakings and promote the construction of meteorological modernization. By analyzing the situation faced by the education of meteorological higher talents, this paper expounds the necessity and feasibility of constructing the training system of meteorological higher talents, puts forward the construction method, scientific connotation and key tasks of the training system of meteorological higher talents, and provides a scientific basis for how to construct the education and training system of meteorological higher talents and improve the core ability of meteorological education and training.

Keywords

higher meteorological talents, education and training, system construction

1. The Significance of Constructing the Education System of Meteorological Higher Talents

The 18th CPC National Congress made the strategic deployment of building a learning, service-oriented and innovative Marxist ruling party, and put forward higher requirements for strengthening and improving the education and training of meteorological higher talents and improving the quality and ability of cadres. Meteorology is a science and technology-based and basic public welfare undertaking, which is related to the national economy and the people's livelihood, national security and sustainable development. The report of the 18th National Congress of the Communist

Party of China first proposed to improve the defense ability against meteorological disasters, and the role of meteorological work in national economic and social development is becoming increasingly prominent to adapt to the new situation and meet new needs, the key lies in talents.

Compared with other industries, meteorology has its own characteristics. First, the atmosphere has no national boundaries. Scientific and technological information such as meteorological observation and prediction requires global sharing. Operational technologies such as information networks and prediction services must be in line with the world, with obvious globalization characteristics. Second, as a scientific and technological, basic public welfare undertaking, the wide application of high and new technologies such as meteorological satellites, radars, computers and information networks, and numerical prediction makes it have significant professional characteristics. Third, China's meteorological department now has 382 national, provincial and prefecture level meteorological stations, 2423 county-level meteorological observation stations and more than 60000 regional automatic stations. It has built operational systems such as a detection network composed of more than 200 radars and a meteorological satellite observation network backed up by two satellites. Data collection, processing and business layout are highly unified, and business management has obvious integration characteristics. The above "three characteristics" not only determine the importance of meteorological higher talent education and training, but also determine the necessity of accelerating the establishment of meteorological higher talent training system in accordance with the concept of lifelong education to meet the needs of career development.

2. Japan's Meteorological Personnel Training and Education for China's Reference

2.1 Strengthen Resource Sharing

Efforts can be made from both inside and outside the meteorological department: in Japan, the construction of the meteorological information sharing platform should be improved as soon as possible within the Department, and supporting construction should be carried out from the aspects of business management, rules and regulations, so as to ensure the rapid and effective exchange of all kinds of meteorological information relying on the platform and realize the maximum resource sharing; Outside the Department, we will continue to implement the strategy of expanding fields, and strengthen substantive cooperation with relevant departments, universities and scientific research institutions in the network of meteorological stations, information exchange, academic exchanges, scientific research and development, so as to achieve mutual benefit and win-win results and resource sharing.

2.2 Diversified Training forms of Meteorological Talents

In addition to regular meteorological universities, Japan's Meteorological education also includes various meteorological research institutions, meteorological magazines and academic journals, which train and send a large number of meteorological experts to other countries in the world every year.

China can invest more money in meteorological research institutions, establish special research institutions with high-quality meteorological talents, publish and distribute meteorological research magazines with Chinese characteristics, and at the same time, increase the selection of excellent business technology and management backbone to participate in a variety of technical training. In addition, according to the urgent need of meteorological service capacity construction in various regions, high-level world-class meteorological experts can be selectively hired to work or give lectures in meteorological universities for a short time, so as to promote the further improvement of China's higher meteorological education and meteorological science and technology.

2.3 Pay Attention to On-the-job Training

The on-the-job training of Japanese Meteorological Department staff is an important issue related to development, and the quality assurance and diversification of training forms are also crucial. Japan has specially established a training institution directly under the Meteorological Bureau, which is more closely linked with business; Independent training institutions that are separated from business institutions can better establish contacts with scientific research and business institutions and are easier to absorb New knowledge and skills. China should actively cultivate and develop this kind of training, and I believe that the advantages of this kind of training will become more and more obvious.

3. Problems Existing in the Current Training of High-level Meteorological Talents

3.1 The Contradiction between the Shortage of High-level Meteorological Talents and the Expansion of Industry Demand is Prominent

Meteorological observation has developed from traditional thermometers and barometers to today's huge network composed of computers, communications, radars, remote sensing, satellites and other high-tech. meteorological services have also developed from the traditional broadcasting of sunny and rainy days to decision-making services, public services and professional services. The development of Meteorology has stimulated the demand for traditional meteorology talents and other relevant high-tech talents. Since the reform and opening up, China's meteorology has accumulated a lot of science and technology, and cultivated a considerable number of meteorological talents. However, the bottleneck restricting the development of the cause is the lack of high-level and high-quality talents. Qin Dahe, former director of the China Meteorological Administration, once pointed out at the National Meteorological Department talent work conference that "there is a lack of high-level and compound meteorological science and technology talents, especially outstanding discipline leaders and generals, and teams with domestic and international competitiveness". The shortage of high-level meteorological talents and the lag of talent training are the main reasons. According to the author's statistics, at present, there are few colleges and universities that offer meteorology majors in China, and even fewer of these colleges and universities can carry out the cultivation of Meteorology postgraduates. Only a dozen or

so colleges and universities, including Peking University, Nanjing University, Nanjing University of information engineering, Lanzhou University, PLA University of science and technology, China Ocean University, Chengdu Institute of information engineering, Sun Yat sen University, China University of science and technology etc. As a result, the scale of graduate education in meteorology is obviously smaller. According to the National Meteorological Department talent recruitment fair held in our school in recent years, the supply of meteorological talents is obviously in short supply, and the meteorological department is thirsty for high-level meteorological talents.

3.2 The Training Specifications of High-level Meteorological Talents are not fully in line with the Needs of Meteorological Business

In social development, higher education, which is closely related to employment orientation, can transform the heavy population burden into huge human resources and become an important source of promoting economic growth and social development. As a public welfare industry, the meteorological industry is closely related to all walks of life, such as agricultural meteorology, marine meteorology, traffic meteorology, energy meteorology, etc. to provide more professional and refined meteorological information services for economic and social development, this puts forward higher requirements for meteorological practitioners. However, the current training of high-level meteorological talents is not fully in line with the actual needs of meteorological business, which is highlighted in the following points: first, the type and structure of meteorological postgraduate education in China is single, which is limited to the training of academic talents, while the training of Applied Meteorological Engineering Masters is still blank. This is related to the education mode that China's higher education takes cultivating "knowledge reserve" talents rather than "knowledge ability" talents as the core goal. The long-standing thinking practice of emphasizing learning over application, focusing on academic level evaluation and ignoring social demand evaluation leads to mismatching with social development. Theoretical research accounts for an absolute proportion of the graduate students trained, and there is a shortage of high-level applied talents required by the industry. In this way, even if the number is increased, it will also cause a huge waste of educational resources and a huge backlog of talents.

Secondly, the subject structure of graduate education is unreasonable, which is not conducive to the cultivation of compound meteorological talents. The setting of disciplines and degree points in China is that first-class disciplines are set under large disciplines, and second-class disciplines are set under first-class disciplines. The division of majors is too narrow, fragmented, and lack of connection. At present, the sources of meteorological talents in China are mainly scattered in many disciplines, such as atmospheric science, electronic science and technology, instrument science and technology, computer science and technology, environmental science and engineering. Their knowledge structure is relatively independent, and it is difficult to adapt to the characteristics of wide scope of modern meteorological business, large span of knowledge, and interdisciplinary intersection, resulting in the mismatch between

China's higher level of meteorological science and lower level of meteorological service. It has formed the current situation that although China is a meteorological power, it is not a meteorological power.

Finally, for a long time, colleges and universities in China are used to running schools behind closed doors, and graduate education shows a distinctive "closed" feature. Schools are not closely related to society, students and practical applications, so that the role of graduate education in promoting the development of meteorological undertakings has not been fully played.

4. Thoughts on the Construction of Meteorological Higher Talents Education and Training System under the New Situation

"Talents are the key to the development of the cause, and training must go first" is an important experience and law recognized in the long-term practice of the education and training of meteorological cadres. We should strive to build the meteorological education and training platform into a platform for policy publicity, achievement promotion, professional education and promoting innovation, so that education and training can truly become a long-term booster to promote the development of meteorological undertakings. It is very important to build a scientific and reasonable training system. The construction of meteorological cadre training system must follow the concept of lifelong education, and pay more attention to the connection with basic education in Colleges and universities, pay more attention to the combination with the actual needs of modern meteorological business management, pay more attention to the development trend of world advanced meteorological science and technology, follow the law of meteorological personnel training and the special law of meteorological education and training, and constantly improve the systematization, pertinence and effectiveness of training.

4.1 We Should Strengthen Top-level Design with an International Perspective

Under the new normal, the development of China's meteorological industry is in a critical period of comprehensively promoting modernization and in the crucial period of comprehensively deepening reform. The meteorological industry will strive to build an open and efficient meteorological scientific and technological innovation and talent system focusing on core technology. We should adhere to the core position of scientific and Technological Development in the overall development of meteorological industry, and adhere to scientific and technological innovation as the fundamental driving force to promote the development of modern meteorological business, Adhere to the scientific and technological innovation throughout the whole process of meteorological modernization. We should strengthen the top-level design with international vision, grasp the development trend of World Meteorological Science and technology, face the international scientific and technological frontier, closely follow the pace of building an innovative country, seize the strategic commanding height of scientific and technological development, and provide scientific and technological reserves for the development of modern meteorological business. Deepen the reform of meteorological science and

technology system, improve the management system of scientific research projects, improve the collaborative innovation system, and improve the scientific and technological evaluation and incentive mechanism, so as to inject new vitality into the modernization of meteorology. Accelerate the construction of meteorological science and technology innovation system, optimize the allocation of scientific and technological resources, comprehensively promote the scientific and technological guarantee of meteorological modernization, and improve the development efficiency of meteorological modernization.

4.2 Meteorological Talents and Key Points of Meteorological Education Development

In recent years, the development of meteorological talents in China has made good progress, which has laid a solid foundation for the realization of the development goal of meteorological talents in recent years. First, we should focus on the construction of high-level leading talents and young talents, and comprehensively promote the development and coordinated development of all kinds of human resources. Second, we should optimize the structure of talent team, introduce and cultivate talents urgently needed in key areas of meteorological modernization, and focus on strengthening the construction of scientific and technological research and development, business front-line and grass-roots talent team. Third, we should cultivate high-level scientific and technological innovation teams, give full play to the role of the team in concentrating advantages and tackling key problems and cultivating talents, and stimulate the innovative vitality of talents. Fourth, we should formulate talent-training plans according to the needs of meteorological modernization. Improve the meteorological training system, strengthen the construction of meteorological training capacity, carry out all-round and multi-level meteorological education and training, and promote the modernization of meteorological education and training. Fifth, we should deepen the cooperation between provinces and ministries and between bureaus and universities, strengthen the construction of meteorological disciplines and majors, and promote the training of basic talents. Constantly optimize talent growth policies and institutional environment, and form a good atmosphere of respecting talents, knowledge and fair competition. Sixth, we should speed up the innovation of talent development system and mechanism, establish and improve scientific talent work evaluation, talent evaluation and discovery, selection and use, staffing management, mobile allocation, professional title evaluation and employment, salary distribution, incentive and other mechanisms, and build a meteorological talent system full of vitality and vitality.

4.3 Construction of Meteorological Personnel Education and Training System

4.3.1 Curriculum System Construction

Strengthen demand research, adhere to the basic principle of focusing on the development of meteorological undertakings as an organizational demand and taking into account the needs of units and individuals, strive to build a multi-level, full coverage and modular modern training curriculum

system that connects with the basic education of University Majors, meets the development of meteorological undertakings and has the characteristics of lifelong education, enrich and improve the subject guide of meteorological cadre training, Continue to improve the construction of core training courses for weather forecasters and leading cadres, and design various main classes in advance according to the phased characteristics and specific needs of the reform and development of meteorological undertakings.

4.3.2 Construction of Teaching Material System

Build a series of practical training textbooks that meet the development of modern meteorological business and training needs, improve the real-time update system of training textbooks, so that the training textbooks can reflect the progress of meteorological business and the latest scientific and technological achievements in a timely manner; strengthen the planning and construction of training materials, and constantly improve the construction process and management system of training materials.

4.3.3 Construction of Teaching Staff

We should cultivate and build a group of high-level backbone full-time teachers with obvious professional continuing education characteristics around the improvement of the ability and quality of leading cadres and the needs of the construction of professional meteorology and modern management disciplines such as numerical prediction and data assimilation technology, short-term approach prediction, climate prediction, radar satellite and other comprehensive detection; constantly improve the construction of part-time teachers' professional pool, and make full use of excellent teacher resources in developed countries; we should strive to build a team of teachers with good quality, appropriate scale, reasonable structure and a combination of full-time and part-time teaching to meet the development requirements of modern meteorological training.

4.3.4 Construction of Teaching Environment

Strengthen the construction of modern training environment such as meteorological distance learning resource sharing platform, modern weather forecast laboratory, meteorological satellite and radar application training laboratory, comprehensive meteorological observation and maintenance guarantee laboratory, meteorological disaster emergency management scenario simulation classroom, develop modern training technologies such as simulation and simulation, and constantly improve and improve the training environment.

4.3.5 Teaching Management

Establish a unified and standardized digital management platform for the education and training of meteorological cadres, organize various training projects at different levels, types and batches, strengthen the effect evaluation after training, and constantly improve and improve the training quality. Strengthen the overall planning and coordination of meteorological training, give full play to the

respective advantages and complementary roles of meteorological education and training institutions, and make the meteorological cadre education and training system form an organic connection and interrelated whole.

5. Conclusion

The education and training system for meteorological cadres is one of the important cornerstones of the development of meteorological undertakings and an important support for the construction of meteorological talents, which is of great significance. The construction of meteorological cadre education and training system must follow the law of continuing education and talent training, consider the characteristics of meteorological departments and the actual needs of cadre education, adhere to the principle of openness, adhere to the advanced level of World Meteorological Science and technology, meet the needs of meteorological business management, and connect with basic education. In accordance with the concept of lifelong education, we should scientifically improve the relevant connotation of the curriculum system, teaching material system, teaching staff, teaching environment and teaching organization management system, so as to provide intellectual support and talent guarantee for the greater development of meteorological undertakings.

References

Cai, J. L., & Lin, Q. (2020). Employment intention of graduates majoring in atmospheric science to people in the meteorological department Enlightenment of talent recruitment. *Progress of meteorological science and technology*, *10*(02), 12.

Chen, J. (2021). Review and Prospect of the development of the history of meteorological science and technology at Nanjing University of information engineering. *Reading Jiang Xue Journal*, *13*(03).

Fei, M. M., Peng, G. H., & Liu, D. M. et al. (2021). The “four in one” production education integration education mode of geoscience talents Exploration. *Geological education in China*, *30*(02).

Gao, X. H., & Deng, B. S. (2007). Summary and analysis report of remote training on research results of China’s meteorological development strategy. *Meteorological soft science*, *12*(1), 5-22.

Lin, J. (2018). Construction of Engineering Majors for freshmen with interdisciplinary integration. *Research on higher engineering education*, *1*(3), 45-48.

Qin, D. H. (2004). Research on the development strategy of China’s meteorological industry. *Meteorological Publishing Society*, *7*(12), 22-26.

Wang, Q. (2021). Literature research on the cultivation of “double qualification” in Higher Vocational Education. *Modern vocational education*, *2*(32), 09-11.

Wu, X. H., Guo, J., & Zhao, F. (2014). Strategic research on the development of meteorological service industry. *Modern vocational education*. Beijing: Science Press.

Development Research Center of China Meteorological Administration. (2015). *China Meteorological development report*. Beijing: Meteorological publishing house.

Development Research Center of China Meteorological Administration. (2016). *China Meteorological development report*. Beijing: Meteorological publishing house.