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The Value and Cultivation of High-Level Scientific and Technological Management Talents in the New Era

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Abstract: Against the backdrop of the new technological revolution and industrial transformation, scientific and technological innovation has become an important part of great-power competition. As the key link connecting scientific and technological resources with strategic needs, high-level scientific and technological management talents' value realization and cultivation quality are directly related to the improvement of the overall efficiency of the national innovation system. At present, China is in a critical stage of transitioning from a "major scientific and technological power" to a "world-class scientific and technological power". We should further clarify the era value of high-level scientific and technological management talents, analyze the prominent problems in cultivation more accurately, and thus construct a more scientific and efficient cultivation system. In view of this, this paper analyzes the value and cultivation of high-level scientific and technological management talents in the new era and puts forward relevant strategies.

Keywords: New era; High-level scientific and technological management talents; Value; Cultivation

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1. Core value of high-level scientific and technological management talents in the new era

1.1. Strategic cornerstone supporting independent and self-reliant science and technology

Currently, global scientific and technological competition is becoming increasingly fierce. The independent and controllable development of key core technologies must rely on the independent cultivation and innovative breakthroughs of high-level talents. As organizers and leaders of scientific and technological innovation activities, high-level scientific and technological management talents can accurately align with national strategic needs. They play an important role in coordinating the innovation chain and industrial chain, and also have an undeniable significance in tackling key core technologies [1]. At the same time, high-level scientific and technological management talents can strengthen the strategic orientation of scientific and technological resource allocation, guide innovative elements to gather in fields of national major needs, thereby further improving the

overall efficiency of the national innovation system and laying a solid talent foundation for achieving a high level of scientific and technological independence and self-reliance.

1.2. Key engine for cultivating new-quality productive forces

New-quality productive forces are an advanced form of productive forces dominated by innovation, with core characteristics of high technology, high efficiency, and high quality. Their cultivation and development are inseparable from the support and leadership of high-level talents. As a bridge between scientific and technological innovation and industrial development, high-level scientific and technological management talents can effectively promote the transformation of scientific and technological achievements from the "laboratory" to the "production line", thereby gradually realizing the organic unity of innovative value and economic value. High-level scientific and technological management talents can keenly capture industrial development needs and technological innovation opportunities. They can better accurately align scientific and technological innovation achievements with actual industrial needs, accelerating the transformation and application of scientific and technological achievements [2]. At the same time, high-level scientific and technological management talents can lead scientific research topics and technological R&D directions, focusing on key technical bottlenecks in industrial transformation and upgrading, which is conducive to promoting the in-depth integration of disruptive technologies, cutting-edge technologies with the real economy, and is of great significance for enhancing the core competitiveness of industries. In emerging fields such as new energy and high-end equipment manufacturing, high-level scientific and technological management talents can promote the transformation of industries towards high-end and green development by coordinating scientific and technological innovation and industrial layout, injecting strong momentum into the cultivation and growth of new-quality productive forces [3].

1.3. Important support for improving the national innovation ecosystem

A sound innovation ecosystem is an important soil for talent growth and scientific and technological innovation, and high-level scientific and technological management talents play an important role in building the innovation ecosystem. From an institutional perspective, high-level scientific and technological management talents can promote the reform of talent development systems and mechanisms in combination with the laws of scientific and technological innovation and the characteristics of talent growth, which is conducive to reforming institutional and mechanism obstacles, such as excessive administrative intervention, and can gradually build a talent evaluation system oriented towards innovative value and ability cultivation. From the perspective of talent echelon construction, high-level scientific and technological management talents can play a "mentoring" role, better cultivating young scientific and technological management talents and innovation teams, which can gradually build a more reasonably structured talent team system [4]. At the same time, high-level scientific and technological management talents can effectively promote the spirit of scientists, create a social and cultural atmosphere that advocates innovation and courage to explore, thereby further enhancing the sense of honor of scientific and technological talents.

2. Problems in the cultivation of high-level scientific and technological management talents in the new era

2.1. Imperfect cultivation system and low supply-demand matching degree

Currently, China's high-level scientific and technological management talent cultivation system has problems

such as “valuing theory over practice”, which will gradually lead to a disconnect between talent cultivation and actual needs. In terms of cultivation subjects, universities usually serve as the main position for talent cultivation, and their cultivation models are mainly academic talent-oriented. The curriculum system of some schools is relatively outdated, and the corresponding textbook content is also disconnected from scientific and technological innovation practices and industrial development needs. Many teachers also lack core competencies such as scientific and technological management practices and achievement transformation [5]. The scientific and technological management-related majors in some universities still focus on traditional management discipline knowledge, and their coverage of professional knowledge in emerging technical fields is insufficient, making it difficult to cultivate compound scientific and technological management talents who meet the requirements of the new era. In terms of cultivation models, the industry-university-research collaborative cultivation mechanism of some schools is not sound. The cooperation between universities, scientific research institutes and enterprises lacks depth, and the main role of enterprises in talent cultivation has not been fully exerted [6].

2.2. Unbalanced ability structure and shortcomings in core literacy

Generally speaking, high-level scientific and technological management talents need to have strong comprehensive abilities. However, the scientific and technological management talents cultivated in China currently have the problem of unbalanced ability structure and obvious shortcomings in core literacy. High-level scientific and technological management talents have insufficient strategic thinking ability. Many talents lack the ability to accurately grasp national strategic needs and global scientific and technological frontier trends. It is difficult for them to coordinate scientific and technological innovation and industrial development from an overall perspective, and they lack forward-looking and systematicness in scientific research topics and strategic planning. Some talents are still limited to technical R&D or management work in a single field, lacking a systematic thinking that connects the innovation chain and industrial chain, which makes it difficult for them to adapt to complex scientific and technological innovation tasks [7]. At the same time, some high-level scientific and technological management talents have weak practical operation abilities. Due to the lack of practical teaching links in the cultivation process, most talents have no practical experience in major scientific research projects and industrial transformation and upgrading, which leads to their insufficient ability to control practical work such as scientific and technological achievement transformation and scientific research team management. Moreover, some high-level scientific and technological management talents are lacking in cross-border integration capabilities. Currently, many scientific and technological management talents are limited to a single disciplinary background, and they lack the ability to integrate knowledge from different disciplines and industrial fields, which makes it difficult for them to promote multi-field collaborative innovation [8].

2.3. Inadequate systems and mechanisms, restricting cultivation efficiency

System and mechanism obstacles are the key factors restricting the improvement of the cultivation quality of high-level scientific and technological management talents. In terms of the talent evaluation mechanism, the tendency of “four-only” (only papers, titles, academic qualifications, and awards) in some units has not been completely eliminated. When evaluating high-level scientific and technological management talents, they still take papers, titles, academic qualifications, and awards as core evaluation indicators, which leads to ignoring the innovative value and practical ability of talents. This single evaluation orientation is likely to lead high-level scientific and technological management talents to over-pursue academic achievements, ignoring the improvement of their practical ability and strategic management ability, which is also contrary to the cultivation

goal of high-level scientific and technological management talents. In terms of the incentive mechanism, the incentive methods for high-level scientific and technological management talents are relatively single, usually dominated by material incentives, lacking corresponding spiritual incentives and development incentives, which makes it difficult to fully stimulate the innovation vitality and cultivation enthusiasm of talents [9]. At the same time, the achievement transformation incentive mechanism for the cultivation of high-level scientific and technological management talents is not perfect, the distribution ratio of scientific and technological achievement transformation benefits is unreasonable, and the benefit distribution mechanism among enterprises, universities, and scientific researchers is not clear enough, which also affects the enthusiasm of talents to participate in scientific and technological achievement transformation to a large extent. In terms of the talent flow mechanism, the talent flow barriers between industries and regions have not been completely broken, which leads to unsmooth talent flow channels and makes it difficult for corresponding innovative elements to flow freely and be optimally allocated.

3. Optimization strategies for the cultivation of high-level scientific and technological management talents in the new era

3.1. Construct a collaborative cultivation system to improve supply-demand matching degree

To improve the cultivation effect of high-level scientific and technological management talents, we should be guided by national strategic development needs and construct a collaborative cultivation system of "universities-scientific research institutes-enterprises", so as to effectively achieve the accurate alignment between talent cultivation and actual needs. To this end, we should further optimize the curriculum system setting, highlighting strategic orientation and practical orientation. Universities can reconstruct the curriculum system of scientific and technological management-related majors in combination with national major strategic needs and emerging industrial development directions, adding more content related to national strategies and scientific and technological frontiers, so as to better complete the tackling of key core technologies and the cultivation of new-quality productive forces [10]. At the same time, we should continue to strengthen the construction of interdisciplinary courses, actively promote the cross-integration of scientific and technological management with emerging disciplines such as artificial intelligence and big data, and also offer some interdisciplinary elective courses, which can effectively cultivate the cross-border integration ability of talents. Teachers also need to update textbook content in a timely manner, integrating the latest scientific and technological innovation achievements and management practice cases, so as to improve the pertinence and timeliness of courses. At the same time, we should continue to innovate cultivation models, deepen industry-university-research collaborative cultivation, so as to give full play to the advantages of the new system and promote the construction of talent cultivation bases in universities and scientific research institutes, establishing a more stable cooperation platform. In addition, we need to strengthen personalized cultivation to better meet the differentiated needs of students. Teachers can formulate more personalized cultivation plans according to the cultivation needs of scientific and technological management talents in different fields and at different levels, set differentiated cultivation goals and content for different groups such as strategic scientists and scientific and technological leaders, and adopt order-based cultivation, special training and other methods to accurately match national strategic needs and industrial development needs [11].

3.2. Focus on improving core literacy to build a compound talent team

To improve the cultivation effect of high-level scientific and technological management talents, we should take improving the comprehensive ability of talents as the core, further focus on core literacy such as strategic thinking and practical ability, and construct a comprehensive ability cultivation system. To this end, teachers should further strengthen their own strategic thinking cultivation and continuously improve their forward-looking research and judgment ability. Schools can offer some courses related to national strategies and scientific and technological policies, and also invite some industry experts and strategic scientists to give lectures. At the same time, we should strengthen the cultivation of practical ability, continuously improve students' practical operation level, and continuously increase the proportion of practical teaching, to better integrate practical teaching into the whole process of talent cultivation. Teachers can organize talents to carry out internships and training in enterprises and scientific research institutes, allowing them to participate in practical work such as tackling key core technologies and managing scientific research teams. Moreover, we should continuously improve our own cross-border integration ability to adapt to the needs of collaborative innovation and promote the cultivation of interdisciplinary and cross-field talents [12]. Schools can also establish an interdisciplinary talent cultivation platform according to actual conditions, which can better promote the exchange and cooperation between talents from different majors and fields, thereby effectively breaking disciplinary barriers and industry boundaries and improving the cross-border collaboration ability of talents. In addition, we need to continuously strengthen humanistic literacy and ethical education, and constantly enhance students' sense of social responsibility. To this end, we can try to offer some courses related to scientific and technological ethics and laws and regulations, which can better guide high-level scientific and technological management talents to establish correct values, make them pay attention to the ethical risks and social impacts in scientific and technological innovation, and strengthen the sense of social responsibility and legal awareness of high-level scientific and technological management talents.

3.3. Deepen the reform of systems and mechanisms to stimulate endogenous motivation for cultivation

In the cultivation of high-level scientific and technological management talents, we can take breaking system and mechanism obstacles as a breakthrough, continuously deepen reforms in talent evaluation and incentives, and construct a more favorable institutional environment for the growth of high-level scientific and technological management talents. To this end, we should continue to improve the talent evaluation mechanism, establish a scientific evaluation orientation, resolutely eliminate the "four-only" tendency, and gradually establish a talent evaluation system oriented towards innovative value and ability. In the evaluation, we can take strategic planning ability and practical operation ability as core evaluation indicators. At the same time, we should continue to improve the incentive mechanism, stimulate students' innovation vitality, and construct an incentive system combining material incentives and spiritual incentives [13]. In terms of the salary distribution system, we can implement a distribution method combining agreement-based wages and project-based wages, which can effectively improve the treatment level of talents. In terms of talent flow, we should optimize resource allocation, take the initiative to break talent flow barriers between industries and units, and establish a more scientific and sound talent flow mechanism. At the same time, we should endow students with sufficient scientific research autonomy, which can effectively release their innovation vitality [14].

3.4. Strengthen the construction of teachers and platforms to consolidate the foundation for cultivation support

To improve the talent cultivation effect, we should aim at enhancing the support capacity for cultivating students, continuously strengthen the construction of teachers' teams and practice platforms, so as to provide a solid guarantee for the cultivation of high-level scientific and technological management talents. To this end, we should continue to build a high-level teachers' team, establishing a "on-campus tutor + off-campus tutor" collaborative education teachers' team system, which can further optimize the structure of the teachers' team. At the same time, we also need to try to build a high-quality practice platform to strengthen practice support. Schools should continue to increase investment in the construction of practical teaching platforms, and continuously promote universities to co-build a number of national-level platforms and graduate workstations with enterprises and scientific research institutes [15]. With the help of national strategic scientific and technological forces such as national laboratories and national scientific research institutions, we can try to build a major scientific research project practice platform, which can provide talents with practical opportunities to participate in tackling key core technologies and transforming scientific and technological achievements. Schools can build an international exchange platform according to actual conditions, which can effectively improve students' international perspective. We need to strengthen the construction of international exchange and cooperation platforms, take the initiative to establish cooperative relations with foreign high-level universities and enterprises, and also provide talents with opportunities to participate in international scientific and technological innovation and management practices through joint cultivation, academic exchanges and other methods.

Disclosure statement

The author declares no conflict of interest.

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