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The Promoting Effect of the “Enlisting and Leading” System in Scientific Research Projects on Talent Development

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Abstract:

Based on data from the Science and Technology Departments and policy documents from seven representative regions including Beijing, Shanghai, Zhejiang, Jiangsu, Fujian, Guangdong, and the Guangdong-Hong Kong-Macao Greater Bay Area during 2020-2024, this study employs qualitative methods to systematically examine the impact mechanism and practical challenges of the "Enlisting and Leading" system on talent development. The findings reveal that: First, the "Enlisting and Leading" system is primarily applied to technological projects, with insufficient application in scientific research projects, indicating a clear imbalance in application areas. Second, in strategic industries such as new-generation information technology, bio-medicine, artificial intelligence, and new energy, the system has significantly enhanced the concentration of high-level talents and innovation output efficiency. Third, specific issues exist in the system's implementation, including regional talent mobility barriers, singular evaluation indicators, and low policy execution efficiency.

Therefore, it is necessary to establish a long-term development mechanism by constructing regional collaborative innovation mechanisms, innovating talent evaluation mechanisms, and strengthening policy implementation effectiveness. This requires institutional guarantees regarding organizational leadership, financial support, and supervision and evaluation. The research conclusions provide empirical evidence and policy references for optimizing the design of the "Enlisting and Leading" system and enhancing the effectiveness of talent development policies.

Keywords:

Scientific Research Projects; Enlisting and Leading; Talent Development; Talent Evaluation Mechanism

1.Introduction

The Report of the 20th National Congress of the Communist Party of China explicitly states that we must uphold science and technology as the primary productive force, talent as the primary resource, and innovation as the primary driver. President Xi has repeatedly emphasized the need to vigorously promote mechanisms such as "Enlisting and Leading" in important fields and key areas, stressing that "we must provide opportunities for scientific and technological personnel with genuine abilities to display their talents" and pointing out the need to "innovate the organization of scientific and technological projects by implementing systems such

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as 'Enlisting and Leading' and 'horse racing' to let capable scientific and technological talents take the lead." These important statements have provided direction for reforming scientific and technological innovation systems and talent development in the new era.

Against the backdrop of a new global technological revolution and industrial transformation, scientific and technological innovation has become the main battlefield of international strategic competition. Accelerating the construction of globally important talent centers and innovation highlands, and building a globally competitive talent development system, has crucial strategic significance for achieving high-level scientific and technological self-reliance. To implement President Xi's important directives on scientific and technological innovation and talent work, China continues to deepen scientific and technological system reform. The "Enlisting and Leading" system, as an important reform measure, has opened new pathways for outstanding talents to emerge through establishing a new organizational model of "project-led, capability-oriented, and market-driven." This system breaks through the administrative and hierarchical restrictions in traditional research systems, realizing a flexible talent utilization mechanism of "whoever has the capability does the work," effectively stimulating scientific and technological innovation vitality.

With the nationwide implementation of the "Enlisting and Leading" system, its promoting effect on talent development has become increasingly prominent. Based on the new development stage and guided by Xi 's Thoughts on Socialism with Chinese Characteristics for a New Era, this paper selects representative regions including Beijing, Shanghai, Jiangsu, Zhejiang, Fujian, Guangdong, and the Guangdong-Hong Kong-Macao Greater Bay Area as research subjects. It systematically analyzes the practical effectiveness of this system in promoting talent development, deeply explores the difficulties faced during implementation, and proposes targeted optimization suggestions. The research aims to provide valuable references for improving scientific and technological innovation mechanisms, deepening talent development system reform, and accelerating the strategy of strengthening the country through talent development.

The remaining content of this paper is arranged as follows: Parts Two and Three present the theoretical foundation and literature review; Part Four explores the current practice status of the "Enlisting and Leading" system on talent development; Part Five analyzes existing problems and difficulties; and finally, optimization suggestions and countermeasures are proposed.

2.Theoretical Foundation

2.1 Definition of "Enlisting and Leading"

The concept of "Enlisting and Leading" originated from scientific and technological innovation practices during the British Industrial Revolution. In 1714, the British government enacted the Longitude Act, offering rewards to solve the challenge of measuring longitude at sea, which ultimately led to the invention of precise marine chronometers. This pioneering approach established a precedent for driving technological innovation through major challenges. This method of public listing and reward incentives later evolved into an important institutional model for promoting major scientific and technological innovations (ZENG Jingjing and HUANG Guihua, 2021).

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In China's scientific and technological innovation system, "Enlisting and Leading" refers to an institutional arrangement for major scientific and technological innovation tasks concerning national development and security. Through publicly releasing project requirements, voluntary registration, competitive selection, and contract signing, the most innovative units or teams undertake research tasks and lead projects. Here, "List" refers to clear project objectives and technical requirements, while "Lead" implies granting project leaders full autonomy over personnel, financial, and material resources (ZENG Jingjing et al., 2023).

From an institutional design perspective, "Enlisting and Leading" comprises four key elements: First, demand orientation - setting research projects around national strategic needs; Second, open competition - soliciting solutions from the entire society; Third, capability priority - eliminating restrictions based on status and qualifications to select the most capable teams; Fourth, contract management - ensuring project quality through objective responsibility systems. This system represents both a major innovation in scientific and technological management and a significant breakthrough in talent utilization mechanisms (Zeng Jingjing and Huang Guihua, 2022).

From an operational mechanism perspective, the "Enlisting and Leading" system has achieved a transformation from "top-down" to "competitive bidding," specifically including project release, team application, expert review, merit-based project approval, organization implementation, and assessment acceptance. This mechanism breaks through the administrative and planned restrictions in traditional research project management, establishing a more flexible and efficient innovation organization method.

2.2 Policy Interpretation of "Enlisting and Leading"

From a policy development perspective, the formation of the "Enlisting and Leading" system underwent a gradual process from emergence to refinement. In 2018, when the General Offices of the CPC Central Committee and State Council issued the "Opinions on Deepening Reform of Project Review, Talent Evaluation, and Institution Assessment," it marked the formal establishment of the system by proposing pilot programs and emphasizing the need to break away from overemphasis on papers, titles, and degrees in scientific evaluation.

2020 was a crucial year for the system's development. President Xi's important speech at the Scientists Forum explicitly called for "vigorously implementing mechanisms like 'Enlisting and Leading' in important fields and key areas." The "Opinions on Building a More Complete System and Mechanism for Market-oriented Allocation of Factors" further emphasized "implementing systems like 'Enlisting and Leading' to transform scientific and technological talent advantages into development advantages." These policy documents not only established the top-level design but also provided important guidance for local implementation.

2021-2022 marked the system's deepening and improvement phase. The "14th Five-Year National Science and Technology Innovation Plan" listed "Enlisting and Leading" as a key reform task, with various ministries issuing supporting policies. The Ministry of Science and Technology and other departments released specific regulations on project organization and funding management. At the local level, Beijing, Shanghai, Guangdong, and other provinces developed implementation rules with regional characteristics.

The 20th Party Congress Report further emphasized "deepening science and technology system reform,

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improving the innovation system, and optimizing the distribution of scientific and technological forces." The system has evolved from a single project model to diversified modes, balancing process and results, and developing comprehensive incentive systems. Its scope has expanded from major special projects to various types of scientific and technological innovation projects.

The policy focus has undergone three stages of transformation:

1. Initially focusing on breaking through institutional barriers and administrative restrictions in talent evaluation

2. Mid-stage emphasis on talent cultivation and utilization with a "use-oriented" approach

3. Current stage focusing on building innovative ecosystems and coordinating various elements

Local implementation shows distinct regional characteristics:

1. Beijing leverages its research institution advantages, focusing on basic research applications

2. Shanghai emphasizes industry-university-research collaboration and industrial transformation

3. The Greater Bay Area builds cross-regional collaborative innovation networks utilizing concentrated innovation resources

This policy evolution reflects China's systematic advancement in scientific and technological innovation system reform, progressing from addressing talent evaluation barriers to promoting technological breakthroughs in key areas and efficient allocation of innovation resources. The policy effects are gradually emerging, providing institutional guarantees for scientific innovation and talent development in the new era.

2.3 Theoretical Foundation of the "Enlisting and Leading" System

Innovation management theory provides important theoretical support for the "Enlisting and Leading" system. Using Triple Helix theory analysis, Wang Chengjun et al. (2022) found that the system constructs an innovative governance model involving interaction among three parties: government, enterprises, and universities/research institutes. Through market-based mechanisms, this model integrates innovation resources, breaking through limitations in traditional research systems such as departmental segregation and restricted flow of innovation elements, achieving effective coordination among innovation entities. Additionally, this governance model provides a more flexible and efficient organizational approach for technological innovation.

From an institutional economics perspective, Chen Jin et al. (2023) pointed out that "Enlisting and Leading" significantly reduces transaction costs in technological innovation through institutional innovation and optimizes the allocation efficiency of innovation elements. It plays a particularly important role in addressing issues such as information asymmetry and insufficient incentives in technological innovation. By establishing clear project objectives and assessment mechanisms, it reduces uncertainties in the innovation process and improves resource allocation efficiency.

Regarding talent development theory, Xue Ya et al. (2024) demonstrated that the "Enlisting and Leading"

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system constructs a new talent evaluation system, breaking through the limitations of traditional evaluation systems that overemphasize qualifications and professional titles. This system places greater emphasis on actual innovation capabilities and contributions, providing opportunities for young scientific and technological talents to stand out, forming a talent utilization mechanism oriented towards capability and contribution.

3.Literature Review

3.1 Analysis of "Enlisting and Leading" System Characteristics in Scientific Technology and Research Projects

The "Enlisting and Leading" system in scientific technology and research projects exhibits distinctive characteristics. Through in-depth research on the features of "project lists" and "project leaders," ZENG Jingjing et al. (2023) found that clear demand orientation is key to the system's success. By precisely defining project requirements, national strategic needs are transformed into specific technical research tasks, making innovation activities more targeted and effective. This demand orientation ensures close alignment between technological innovation and national development needs.

Through comparative analysis of multiple cases, Si Linbo et al. (2022) pointed out that market-based competition mechanism is another core characteristic of this system. The selection of optimal teams through open competition breaks away from administrative tendencies in traditional research project allocation, improving the fairness and scientific nature of project undertaking. This competitive mechanism not only optimizes resource allocation but also stimulates the initiative of innovative entities.

Regarding autonomy, research by ZHUO Chengfeng and CHEN Jin (2024) emphasized that full research autonomy is crucial for the system to stimulate innovation vitality. Project leaders are granted independent control over personnel, finances, and resources, allowing flexible resource allocation based on project needs, which improves efficiency and innovation capability. This grant of autonomy greatly motivates researchers' initiative and creativity.

3.2 The Impact Mechanism of "Enlisting and Leading" System on Talent Development in Scientific Technology and Research Projects

In terms of implementation effects, research by Wang Yang and Li Aibin (2024) based on mixed QCA methods shows that the "Enlisting and Leading" system has achieved significant results in promoting technological innovation and talent development. The system has driven major technological breakthroughs while cultivating high-level innovative talents, providing strong support for China's scientific and technological self-reliance.

However, the system faces several challenges in its implementation. Through entropy-Bayesian network analysis, Zhou Tianhui and Yi Gaofeng (2023) revealed risks in system implementation, mainly in project management, resource integration, and results transformation. Improvements are particularly needed in cross-departmental coordination, innovation chain integration, and result transformation mechanisms.

Addressing these issues, Ye Xiaogang et al. (2024) proposed systematic optimization suggestions based on

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Guangdong's reform experience. These include improving system design, strengthening support mechanisms, and optimizing operational processes. They particularly emphasized establishing comprehensive supporting policies, improving scientific and technological innovation service systems, and building more effective result transformation mechanisms. SHA Dechun et al. (2022) explored the Chinese practical process mechanisms and optimization paths for the research project "Enlisting and Leading" system. These suggestions provide important references for further system improvement.

In conclusion, existing theoretical research shows that although the "Enlisting and Leading" system focuses on technology projects, it clearly plays a positive role in breaking through traditional management models, optimizing innovation resource allocation, and driving major breakthroughs. Particularly in talent development, it provides broad opportunities for researchers to fully utilize their capabilities.

Expanding this system from technology projects to research projects still faces various theoretical and practical challenges requiring further exploration and improvement. This requires not only learning from successful experiences in technology projects but also fully considering the unique characteristics of research projects, exploring implementation paths suitable for basic research and theoretical innovation.

Next, this paper will focus on analyzing how the "Enlisting and Leading" system promotes talent development and its current practical status, deeply exploring how system innovation drives reforms in research talent cultivation and utilization mechanisms.

4.Current Practices of the "Enlisting and Leading" System in Promoting Talent Development

The "Enlisting and Leading" system, as a key measure in scientific and technological system reform, has achieved remarkable results in promoting talent development. As representative cases, seven major regions were selected: Beijing, Shanghai, Jiangsu, Zhejiang, Fujian, Guangdong, and the Guangdong-Hong Kong-Macao Greater Bay Area. Through local science and technology department official websites, data was manually collected regarding key areas of "Enlisting and Leading" system implementation from 2020 to 2024. These areas mainly focus on breakthrough disruptive innovation technologies such as integrated circuits, artificial intelligence, and bio-medicine. The specific details are shown in Table 1.

Table 1. Key Implementation Regions of "Enlisting and Leading" System in Major Regions (2020-2024)

Regions	Major Regions
Beijing	Integrated Circuits, Artificial Intelligence, Bio-medicine, Quantum Computing
Shanghai	Bio-medicine, Integrated Circuits, Artificial Intelligence, Aviation and Space Technology
Jiangsu	New-generation Materials, Advanced Equipment, Biological Technology, Green Manufacturing
Zhejiang	Digital Economy, New-generation Materials, Smart Factory, Life and Health Sciences

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Fujian	Electronic Information, New Energy, Marine Technology, Bio-medicine
Guangdong	Next-generation Information Technology, Smart Factory, New Energy, Bio-medicine
Guangdong-Hong Kong-Macao Greater Bay Area	Artificial Intelligence, Biological Technology, New Energy Vehicles, Financial Technology

The "Enlisting and Leading" system has effectively broken-down institutional barriers in talent development. Through the selection mechanism of "letting those who can do the job do it," it has overcome traditional research system limitations such as professional titles and qualifications. Data shows that from 2020 to 2024, Zhejiang Province has cultivated 1,280 innovative teams, with 35% led by young research talents, demonstrating the openness of talent selection. Through this system, the Guangdong-Hong Kong-Macao Greater Bay Area has successfully recruited 586 high-level talents, breaking down institutional barriers to cross-border talent mobility. The specific details are shown in Table 2.

Table 2. Implementation Results of the "Enlisting and Leading" System in Seven Major Regions (2020-2024)

Regions	Number of Completed Projects	Number of Technical Breakthroughs	Number of Recruited Talents	Number of Trained Talents/ Teams	Other Performance Indicators
Beijing	186	152	108	860	Patent Grants:315
Shanghai	235	168	486	920	Achievement Transformation Rate: 86%
Jiangsu	265	286	325	168	Patent Grants: 4,200
Zhejiang	186	168	685	1280	Innovation Platforms: 156
Fujian	156	145	458	96	High-tech Enterprises: 520
Guangdong	428	256	892	156	Technology Transfer Rate: 92%
Guangdong-Hong Kong-Macao Greater Bay Area	196	225	586	185	Joint Laboratories: 86

Secondly, a talent evaluation mechanism oriented towards innovation capability and actual contributions has been established. Jiangsu Province's achievement of 286 technological breakthroughs stems from its evaluation system that emphasizes innovative outcomes. Guangdong Province's efficient completion of 428 projects benefits from making project completion quality a core evaluation indicator, reflecting the personnel orientation of "promoting the capable, repositioning the average, and removing the incompetent."

Thirdly, the system has promoted high-quality development of innovation teams. Investment in the eight regions has shown continuous growth, with an average annual growth rate of 20%, expected to double in 2024

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compared to 2020, providing sufficient resource support for team building. In terms of key field distribution, bio-medicine has been listed as a priority in six regions, while artificial intelligence has formed concentrated layouts in Beijing, Shanghai, and the Greater Bay Area, showing clear characteristics of echelon development. The specific details are shown in Table 3.

Table 3. Investment Scale of "Enlisting and Leading" System in Seven Major Regions (2020-2024) (Unit: 100 Million Yuan).

Regions	2020	2021	2022	2023	2024	Total Five-Year Investment	Average Annual Investment
Beijing	20	25	30	35	40	150	30
Shanghai	18	22	28	32	36	136	27.2
Jiangsu	15	20	25	28	32	120	24
Zhejiang	12	16	20	24	28	100	20
Fujian	8	12	15	18	22	75	15
Guangdong	25	30	35	40	45	175	35
Guangdong-Hong Kong-Macao Greater Bay Area	45	55	65	75	85	325	65

Fourth, distinctive talent development mechanisms have been formed. Each region has established a "project-driven talent development" model based on their industrial advantages. For example, the Guangdong-Hong Kong-Macao Greater Bay Area invested 32.5 billion yuan to form a comprehensive talent development system in fields such as biotechnology and artificial intelligence. Policy support has also shifted from single technical breakthroughs in 2020 to systematic innovation cultivation in 2023-2024. The specific details are shown in Table 4.

Table 4. Policy Innovations of "Enlisting and Leading" System in Seven Major Regions (2020-2024).

Regions	2020 Policies	2021 Policies	2022 Policies	2023 Policies	2024 Policies
Beijing	First Batch of "Enlisting and Leading" Special Programs	China Science & Innovation Action Plan	Key Technology Challenge Program	Next-Generation AI Innovation	Original Technology Breakthrough Plan
Shanghai	30 Science & Technology Innovation Guidelines	Two Thousand Initiative	"Specialized, Refined, Distinctive and Innovative" Program	"Enlisting and Leading" System 2.0	Innovation Consortium
Jiangsu	Key Technology Breakthrough	Innovation Chain Upgrade	Future Industry Planning	High-tech Company Expansion Plan	Smart Manufacturing Upgrade

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Zhejiang	Digital Economy Pioneer Program	Innovation 2025	Future Science City	Smart Manufacturing Upgrade	New Quality Productivity
Fujian	Key Technology Breakthrough	Industrial Chain Upgrade	Maritime Silk Road Innovation Belt	Digital-Physical Integration	AI-driven Innovation
Guangdong	Key Technology Breakthrough	Key Field Research & Development	Industrial Chain Innovation	Digital Economy Development	Future Industry Planning
Guangdong-Hong Kong-Macao Greater Bay Area	Coordinated Innovation Growth	Cross-border Science & Innovation	Global Innovation Harbor	Bay Area Joint Research	Innovation Ecosystem

Overall, diverse incentive mechanisms have stimulated the innovation vitality of talents. Regions have generally established more flexible incentive mechanisms, including institutional innovations in salary distribution and achievement transformation benefits. Meanwhile, by granting researchers greater project autonomy and establishing error-tolerance mechanisms, a favorable environment for talent innovation has been created. These institutional innovations have effectively enhanced researchers' innovation enthusiasm and creativity.

5.Scientific Technology and Research Projects "Enlisting and Leading" System's Practical Challenges in Talent Development

The "Enlisting and Leading" system for research projects is an important innovative measure in advancing China's scientific and technological system reform. However, the implementation of this system still faces many deep-rooted challenges. Based on in-depth research in developed coastal regions of eastern China, this study systematically analyzes key issues in regional coordination, evaluation mechanisms, and policy implementation, aiming to provide theoretical support and practical reference for improving system design and enhancing policy effectiveness.

5.1 Regional Collaborative Development's Structural Imbalance

The coordinated development of regional innovation systems is an important foundation for the effective operation of the "Enlisting and Leading" system. However, practice shows that even in the eastern coastal regions where innovation elements are relatively concentrated, significant structural imbalances still exist in regional collaborative innovation.

First, innovation resource allocation shows "non-equilibrium" characteristics. Innovation highlands such as Beijing, Shanghai, and the Guangdong-Hong Kong-Macao Greater Bay Area, relying on their strong scientific and educational resource endowments and industrial foundations, have formed significant talent aggregation effects. In this process, the "Matthew Effect" of innovation resources continues to strengthen, leading to widening gaps in innovation capabilities between regions. This non-equilibrium in resource allocation not only affects the overall effectiveness of regional innovation systems but also constrains the rational distribu-

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tion and orderly flow of innovative talents.

Second, innovation chain construction faces "fragmentation" dilemmas. Regions generally show homogenization in innovation layout, lacking differentiated development strategies based on comparative advantages. This leads to duplicate allocation of innovation resources and difficulty in forming scale effects; innovation entities lack effective coordination mechanisms, with low integration of industry-academia-research-application; knowledge flow and technology diffusion channels are not smooth, affecting the transformation efficiency of innovation achievements. This fragmentation of innovation chains severely constrains the overall effectiveness of regional innovation systems.

Third, there are "institutional" barriers to the flow of innovation elements. Cross-regional talent mobility and innovation element allocation still face many institutional constraints. Specifically: talent evaluation standards lack uniformity, restricting free talent flow; cross-regional cooperation mechanisms for research projects are imperfect, affecting the optimal allocation of innovation resources; innovation platforms have low levels of openness and sharing, constraining the efficient flow of innovation elements. These institutional barriers not only affect the market-based allocation of innovation elements but also hinder deep-level innovation coordination between regions.

5.2 Systemic Deficiencies in Evaluation Mechanisms

The effective operation of the "Enlisting and Leading" system largely depends on scientific and reasonable evaluation mechanisms. However, the existing evaluation system has obvious systemic deficiencies.

At the conceptual level, there are deep-rooted cognitive biases. First, evaluation orientation shows obvious short-term tendencies, overemphasizing near-term project outputs while ignoring the long-term value of basic research and the cultivation process of original breakthroughs. Second, evaluation methods overly rely on quantitative indicators, using paper publications and patent applications as main evaluation criteria, causing innovation's essential value to be obscured by formalized indicators. Third, evaluation standards tend to be rigid, failing to fully consider the uniqueness of different disciplinary fields, especially lacking adaptive evaluation methods for emerging interdisciplinary fields. These conceptual biases seriously affect the scientific nature and effectiveness of evaluation.

At the evaluation structure level, obvious imbalance characteristics are shown. On one hand, evaluation dimensions are too singular, mainly manifesting as: excessive reliance on expert review while ignoring the importance of market evaluation; emphasizing individual achievements while undervaluing team collaborative innovation contributions; focusing on explicit indicator assessment while ignoring implicit effects such as innovation capacity improvement. On the other hand, evaluation subject composition is not sufficiently diverse, with insufficient participation from industry and end-users, and peer review mechanisms need improvement. This structural imbalance makes it difficult for evaluation results to comprehensively and objectively reflect talent innovation value and development potential.

At the mechanism level, strong rigid characteristics are shown. First, evaluation standards are relatively fixed, making it difficult to adapt to new features and requirements of innovation development; second, there is a lack of dynamic adjustment and feedback optimization mechanisms, with insufficient adaptability in the

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evaluation system; third, the application of evaluation results is too mechanical, simply linking to resource allocation and career development, affecting talents' innovation enthusiasm. This mechanism-level rigidity not only constrains the effectiveness of evaluation but also affects the release of innovation vitality.

5.3 Implementation Deviations in Policy Execution

Policy implementation is key to transforming institutional effectiveness into actual results. However, practice shows that the "Enlisting and Leading" system has significant implementation deviations in policy execution, mainly reflected in policy systems, execution mechanisms, and policy innovation.

At the policy system level, obvious fragmentation characteristics are shown. Although various regions have introduced numerous support policies, there is insufficient coordination between policies, with overlaps and policy gaps. Particularly in talent service supporting policies, support for key aspects such as housing security, children's education, and medical insurance remains insufficient. This policy fragmentation not only affects the overall effectiveness of policies but also reduces their attractiveness and practical effectiveness.

At the execution mechanism level, there is an obvious tendency toward oversimplification. Some regions in the policy implementation process overly pursue short-term effects, simplifying complex talent development issues into funding input and quantitative indicators, ignoring the laws of talent growth and innovation development characteristics. Meanwhile, formalism in policy execution is prominent, with phenomena of "emphasizing introduction over cultivation" and "emphasizing quantity over quality," seriously affecting the sustainability and stability of policy effects.

At the policy innovation level, homogenization characteristics are shown. Regions often imitate each other in policy formulation, lacking differentiated designs based on local industrial characteristics and innovation advantages. Particularly in emerging industry talent cultivation, policy measures tend to be similar, leading to identical talent supply structures and difficulty in forming distinctive talent development advantages. This policy homogenization not only affects the cultivation of regional innovation characteristics but may also intensify irrational competition between regions.

6.Optimization Suggestions for Talent Development in the Scientific Research Project "Enlisting and Leading" System

Solving the challenges of promoting talent development through the scientific research project "Enlisting and Leading" system requires systematic thinking and comprehensive reform: First, establish multi-level regional collaborative innovation mechanisms to optimize innovation resource allocation; second, deepen evaluation mechanism reform to establish a scientific and reasonable evaluation system; finally, improve policy implementation mechanisms to enhance policy execution effectiveness. Only by systematically addressing these challenges can we fully utilize the "Enlisting and Leading" system's positive role in promoting technological innovation and talent development, driving the formation of a more open, inclusive, and vibrant innovation ecosystem.

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6.1 Building Regional Collaborative Innovation Mechanisms

First, establish regional linkage mechanisms. Under the regional integration development patterns of the Yangtze River Delta and Guangdong-Hong Kong-Macao Greater Bay Area, break down administrative barriers to build cross-regional talent cooperation networks. It is recommended to establish regional collaborative innovation alliances to achieve efficient flow and optimal allocation of innovation elements through project collaboration, platform co-construction, and resource interconnection.

Second, promote differentiated development. Based on regional characteristics and comparative advantages, guide the formation of differentiated development patterns. For example, leverage Beijing's advantages in basic research and strategic scientific talent cultivation, Shanghai's characteristics in fin-tech and international talent aggregation, and Shenzhen's features in technological innovation and entrepreneurial talent cultivation to build complementary innovation ecosystems.

Third, improve benefit-sharing mechanisms. Establish cross-regional innovation benefit distribution systems, encouraging deep regional cooperation through intellectual property sharing and achievement transformation profit-sharing. Meanwhile, establish cost-sharing mechanisms for jointly bearing investments in talent cultivation and technological innovation to improve resource utilization efficiency.

6.2 Optimizing Talent Evaluation Mechanisms

First, innovate evaluation methods. Establish a diversified evaluation system, making innovation capability, achievement transformation, and industrial contribution core indicators while weakening over-reliance on quantitative indicators like papers and patents. Introduce third-party assessment mechanisms to enhance evaluation professionalism and objectivity. Design differentiated evaluation standards for different types of talents, especially emphasizing innovation in evaluation methods for interdisciplinary innovative talents.

Second, improve evaluation structure. Construct a three-dimensional evaluation framework of "innovation capability + innovation contribution + development potential." Focus on assessing innovation teams' overall effectiveness and talents' collaborative roles in the innovation ecosystem. Establish long-cycle evaluation mechanisms to reserve growth space for basic research and original breakthroughs. Meanwhile, strengthen assessment of innovation achievements' social and market value.

Third, strengthen dynamic adjustment mechanisms. Establish regular revision mechanisms for evaluation standards to promptly respond to innovation development trends. Improve evaluation feedback systems to continuously optimize evaluation indicators through multi-party participation and thorough demonstration. Establish reasonable application mechanisms for evaluation results to avoid simplistic and absolute use of evaluation results.

6.3 Strengthening Policy Implementation Effectiveness

First, improve policy systems. Construct systematic policy supports frameworks, strengthening coordination among various policy measures. Focus on improving talent service guarantees policies, providing stronger support in housing, education, and healthcare. Establish policy effect evaluation mechanisms to regularly assess policy implementation effects and timely adjust and optimize policy measures.

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Second, innovate execution mechanisms. Establish coordinated promotion mechanisms for policy implementation, clarifying departmental responsibilities and strengthening policy execution coordination. Improve policy fulfillment mechanisms, simplify procedures, and increase policy response speed. Establish policy implementation supervision mechanisms to prevent formalism and bureaucracy from affecting policy effectiveness.

Third, strengthen characteristic development. Encourage regions to formulate differentiated talent policies based on industrial characteristics and innovation advantages. Support policy innovation pilots and timely summarize and promote successful experiences. Establish policy effect evaluation and dynamic adjustment mechanisms to ensure policy measures adapt to regional development needs.

6.4 Building Long-term Development Mechanisms

First, improve organizational leadership. Establish cross-departmental coordination institutions responsible for policy formulation, resource allocation, and supervision evaluation. Establish regular consultation mechanisms to promptly solve problems in policy implementation.

Second, strengthen funding guarantees. Set up special development funds to provide stable financial support for talent development. Innovate funding usage methods to improve fund utilization efficiency. Establish diversified investment mechanisms to attract social capital participation.

Third, strengthen supervision and evaluation. Establish scientific monitoring and evaluation systems to regularly assess policy implementation effects. Improve information feedback mechanisms to promptly identify and solve problems. Establish policy dynamic adjustment mechanisms to ensure continuous optimization of policy measures.

Author Contributions

Conceptualization: Yuan WU; Methodology: Ziwei LI;Formal analysis: Yuan WU, Ziwei LI; Data Curation: Ziwei LI; Writing – original draft preparation: Yuan WU; Writing – review and editing: Yuan WU; Visualization: Ziwei LI; Supervision:Ziwei LI; Project administration: Yuan WU; Funding acquisition: Yuan WU.

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