



Research on Introduction and Cultivation Mechanism of High-level Talents in Emerging Industries from the Perspective of Toughness Theory

 Zhang Liangfei¹,  Huang Yuxi^{1*},

¹Health Management Department of North Henan Medical University, Xinxiang City, China

*Corresponding Author Email: 549236288@qq.com.

Abstract

Competition in science and technology and manpower has become a key element of global competition. China is vigorously promoting the innovation-driven development policy and the people-centred national talent strategy to seize the commanding heights in the trend of rapid technological advancement and industrial change, and the governments of provinces, cities and counties are focusing on the development of science and technology innovation parks and regional technological innovation centres as a key development strategy in the hope of driving the development of industries through scientific and technological innovations and industry advancement. Based on environmental adaptation, this article systematically studies how to attract and cultivate high-end talents in emerging industries. The article reviews the problems of the traditional mechanism for cultivating high-end talents and summarises the fragile mechanism of the existing mechanism for attracting talents under external impact. Relative to the existing human resource management mechanism, the article provides a high-level four-dimensional resilient talent mechanism for system adaptation, which integrates the four major elements of strategic planning, enterprise linkage, ecosystems and services, and policy adjustment in order to enhance the system's resilience to adapt, flexibility and recovery, and resilience and innovation capabilities. Specific means of realisation include globalised connectivity, enterprise linkage incentives, extension of internet facilities, market-based ecosystem building and regulatory adjustments. A range of measures constitute a system of talent management that can be used to address challenges, effectively adapt to change and maintain forward momentum. This study introduces a new concept of flexibility to the field of public administration, while providing theoretical and operational references for city governments to shift from competing for policy orientation to building an ecosystem in developing human resources for emerging industries.

Keywords: Resilience Theory; High-Level Talent; Emerging Industries; Talent Recruitment and Cultivation Mechanism

How to Cite: Liangfei, Z., & Yuxi, H. (2025). Research on Introduction and Cultivation Mechanism of High-level Talents in Emerging Industries from the Perspective of Toughness Theory. *Government & Resilience*, 3(2), 75-90. <https://doi.org/10.62503/gr.v3i2.35>

Copyright © 2025 by Authors, Published by Dealings Foundation Institute, Indonesia. This work is licensed under the CC BY-NC-SA 4.0 (<https://creativecommons.org/licenses/by-nc-sa/4.0>).

Introduction

Demands of the times: the strategic transition from the demographic dividend to the talent dividend

As China's economic development enters a new normal, the traditional demographic dividend is gradually fading, and the power source of economic growth must shift to the innovation-led talent dividend. As the core carrier of knowledge, technology, and management innovation, high-level talents are the primary resource for promoting the transformation and upgrading of industrial structures and achieving high-quality economic development (Jia *et al.*, 2022). Especially in the field of emerging industries, such as biology and new medicine, artificial intelligence, and new materials, its development is highly dependent on breakthroughs and transformations in cutting-edge science and technology, which undoubtedly cannot be separated from a large-scale, reasonably structured, and well-qualified high-level talent team. Therefore, the ability to effectively attract, gather, and cultivate high-level talents directly determines a region's resilience and development potential in the emerging industry track. To illustrate how the weakening demographic dividend is reshaping China's economic trajectory, the following visualization presents the declining trend in the country's working-age population (see Figure.1).

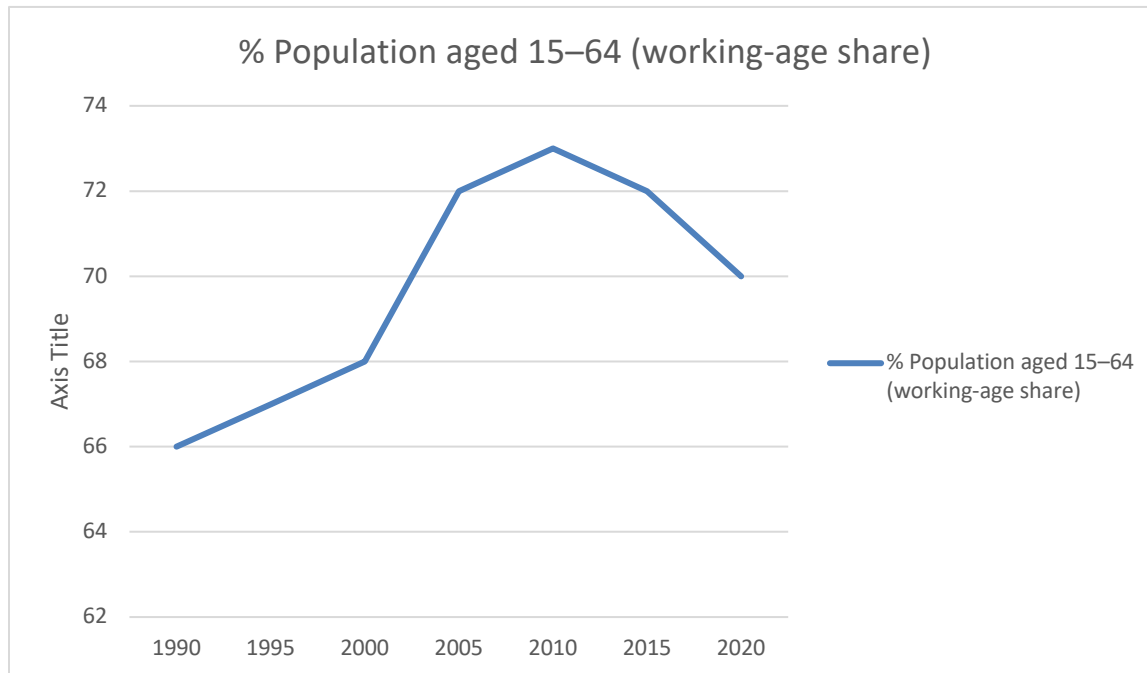


Figure 1. Declining proportion of China's working-age population, illustrating the demographic pressures that heighten the strategic importance of attracting and cultivating high-level talents in emerging industries.

Source: Indexmundi, 2025.

Based on figure 1, since around 2010, the proportion of China's working-age population (ages 15–64) has been steadily declining, signaling the end of an era in which abundant labor served as a primary driver of economic growth. This reduction in the productive-age population not only increases the dependency burden of an aging society but also limits the sustainability of a labor-intensive development model. As a result, China is compelled to shift

toward an innovation-driven growth strategy, emphasizing productivity improvements and the cultivation of high-level talent—particularly in strategic and emerging industries that rely heavily on advanced knowledge and technology.

Dilemma: Increasingly white-hot competition for talent and policy homogenisation

In the face of scarce and highly valued talent resources, the competition for talent among cities and regions has intensified. To stand out in the competition, governments around the world continue to increase policy chips, from substantial project subsidies and settlement fees to providing research start-up funds, in an effort to address children's education, among other initiatives (Ditsche et al., 2023). The means are endless. However, while this policy tournament can attract some talents in the short term, it has also brought about many problems. On the one hand, it significantly raises the cost of attracting talent and puts pressure on local finances.

On the other hand, the simplistic mode of accumulating wealth is likely to lead to policy homogenization, a lack of long-term and systematic planning, and it isn't easy to form a lasting attraction. Most regions are facing difficulties in attracting people and even more difficulties in retaining them, and talent lacks the "stickiness" to continue to make a significant local contribution (Wu & Kao, 2022). Like many other industries, while we have made breakthroughs in recruiting skilled talent, we need to make considerable efforts to improve and expand the current system. In particular, it is important to create an atmosphere in which the best and brightest can grow and pursue their careers and make a long-term positive impact on the local community.

Theoretical needs: resilience theory provides new perspectives on talent work

With the pressure of the internal and external environment and the risk of uncertainty, the establishment of a rational system of highly qualified personnel has become a management theme in the field of science and technology (Yazdizadeh, 2025). The emergence of resilience provides new perspectives on this as well. The perspective of resilience theory focuses on the ability of a system to adapt, cope, recover, and potentially reinvent itself when exposed to external pressures and shocks. Applying the principles of resilience to explore ways of attracting and nurturing regional talent has great theoretical and practical significance. It requires us to go beyond the traditional, linear policy thinking, and no longer regard talent work as a simple introduction-placement process, but as a complex, dynamic ecosystem that is closely coupled with industry, science and technology, finance, and the social environment. By establishing a resilient talent ecosystem, researchers can not only maintain the stability and vitality of the core talent team under the impacts of intensified global competition for talents, sudden changes in technological routes, and macroeconomic fluctuations, but also proactively adapt to the changes and achieve iterative upgrading of the structure and quality of talents through the adjustment and optimisation of the internal mechanism, which will ultimately provide an inexhaustible impetus for the sustainable development of the region's emerging industries.

Industry Focus: Typicality and Specificity of the Biological and New Pharmaceutical Industry

The selection of the biology and new medicine industry as a representative of the emerging industry in this study is highly typical. This industry is a typical knowledge-intensive and technology-intensive sector, characterized by a long R&D cycle, high investment, high risk, and high interdisciplinary integration requirements (Bambi & Pea-Assounga, 2025). These characteristics determine its extremely high dependence on high-level talents, in which the value of talent capital plays a decisive role. At the same time, global competition in this field is extremely fierce, and technological iteration is rapid, which places extreme demands on the international vision and innovation abilities of talents. Therefore, studying the talent problem in this industry can most

profoundly reveal the pain points and blockages in the current talent introduction and training mechanisms, explore the path to building a resilient talent system, and provide a valuable reference for other emerging industries.

Based on the strategic positioning of building an "industrial science and innovation centre", this study takes responding to the fierce competition for talents and building a sustainable talent ecosystem as a realistic concern, introduces the cutting-edge perspective of resilience theory, and brings emerging industries such as bio- and new pharmaceuticals as a specific research object, aiming to systematically analyse the vulnerability and resilience of the current talent introduction and training mechanism. The purpose of this study is to systematically investigate the vulnerability and toughness of the current talent introduction and training mechanism. Through theoretical construction and comparative analysis, this study is expected to explore and put forward a set of mechanism optimisation solutions that can effectively enhance the resilience of regional talent system, and provide both theoretical depth and practical value for local governments to "attract, retain, and make good use of" high-level talents under the new situation, to achieve the long-term, rapid and sustainable development of enterprises. The conference will provide both theoretical depth and practical decision-making references.

Literature Review

Evolution of human capital theory

Human capital theory is the central theory that examines the role of human resources in economic development (Sobel, 1978). In his classic work *The Wealth of Nations*, although the concept of human capital has not yet been explicitly put forward (Manuelli & Seshadri, 2014), he has gained a deep insight into the fact that investment in human capital and the skills of labourers are the two key elements directly affecting the income of the individual economy, which lays the ideological foundation for the formation of the subsequent human capital theory. By the mid-twentieth century, Goldin and Katz (2020) first explicitly coined the term human capital, equating it with the individual themselves. According to him, the combination of knowledge, skills, and physical values is the concrete expression of human capital. Schultz emphasised that a country's human capital situation can be measured by a comprehensive assessment of three main variables: the quantity and quality of the workforce, as well as the time invested. His research marked the initial formation of human capital theory. It puts the value of human beings on the same level as material capital and provides a theoretical basis for talent strategies and research on human capital investment for future development. Subsequently, scholars such as Teixeira (2014) further developed human capital theory, applying it to fields including education and healthcare, emphasizing the vital importance of human capital investment for economic growth and social development.

A Literature Study of Talent Acquisition in Emerging Industries

As a new engine of national economic development, the talent introduction strategy of emerging industries has been the focus of academic attention. Relevant research has extensively discussed the talent introduction policies of emerging industries from various dimensions. Zhang *et al.* (2024a) analyze the impact of talent acquisition policies on the productivity of high-level talents, taking the traditional industries in the National City as an example. She emphasised that for specific industries, the talent policy should focus on branding effect, introduce policies that match the local economic and social development, and improve the implementation and tracking system of the policies and the supporting policy system. The above suggests that when studying the introduction of talent in emerging industries, we also need to consider the relevance and operability of policies. Thunnissen and Van Arensbergen (2015) take a broader perspective and propose that research on talent

introduction policies should cover multiple dimensions, such as talent communication, talent appraisal, and talent life, in order to objectively and scientifically analyze policy effectiveness. This shows that a comprehensive and effective policy for the introduction of talents should not only focus on the introduction of talents, but also on their subsequent integration and development. Scholars such as Wang and Sun (2018) generally agree that talent introduction policies must be coordinated with the pace of local economic and social development, and that the recruitment of high-level talents should be carried out in an orderly manner, focusing on the local urgent scarcity of industries and technological fields. In the "biology, new drugs" and other emerging fields is the type of talent demand to focus on the number of senior talent requirements, due to the rapid replacement of high-tech, but also more concentrated and clear requirements for the introduction of senior talent accordingly. Getnet *et al.* (2014) on the current senior talent introduction policy in China to do a critical analysis, the existing The existing senior talent policy lacks collaboration, the incentive mechanism is incomplete, and the management level is backward. When improving the policy in the future, the country needs to consider the factors comprehensively and design a policy with reasonable step-by-step methods and detailed measures for talent introduction. This also has its long-term and strategic significance for the policy guidance of first-class talents in the field of biopharmaceuticals in China, pointing out the comprehensive and forward-looking characteristics of the policy body. Research on talent introduction strategies for emerging industries generally tends to be adaptive to the way of talent introduction, multi-criteria evaluation methods, synchronous and systematic industrial development, and design-based composition. These are exactly the theoretical foundation and practical operation basis of this study.

A Literature Study of Resilience Theory and Talent Acquisition Strategies

The current international economic situation has become increasingly complex, volatile and elusive, and improving enterprise resilience and regional resilience has become the centre of gravity of current development. Incorporating human resource tools into the resilience framework provides a new perspective for unlocking the value of human resources. a new study by Liu *et al.* (2023) points out the importance of talent strategy and proposes five talent initiatives. Increasing investment in human capital, tapping human capital potential, optimising human resource structure, attracting senior professionals, upgrading workforce system development and improving the training environment. It is argued that these initiatives can increase the level of organisational resilience in the face of economic uncertainty and improve the effective running of the business. This, in turn, provides theoretical support for establishing a link between human capital measures and the construction of organisational resilience.

Dahmen (2023) further states that organisational HRM strategy should follow the basic principles of supporting growth, meeting market needs and business objectives, and focusing more on enhancing the agility of the firm. This suggests that HR strategy is no longer the job of the employee affairs department but has become a strategic tool to create competitive advantage, withstand external shocks and ensure growth. Schuler *et al.* (2011) suggests some more specific practices to optimise recruitment activities for overseas employees including improving talent assessment, widening access to funding, improving compensation and benefits, and broadening the ways in which employees are recruited. .They believes that through these diversified strategies, the resilience of enterprises can be continuously enhanced. This provides this study with practical insights into how to improve organisational resilience at the specific operational level of talent introduction. Together, these studies reveal the intrinsic link between talent strategy and resilience: the effective introduction, cultivation and utilisation of high-level talent not only brings innovative dynamism and competitive advantage to an organisation, but also enhances the organisation's resilience, resilience and transformation capabilities through its knowledge, skills and adaptability

when the external environment changes, thus significantly increasing the overall resilience of the organisation.

Literature review and research gap analysis

Comprehensive analysis of the literature on human capital theory, the introduction of talent in emerging industries and the theory of resilience and talent strategy can be seen above, domestic and foreign academics have conducted extensive and in-depth research on the introduction of high-level talent, from the theoretical basis to the practical strategy provides a wealth of insights, which lays a solid theoretical foundation for the research of this paper.

However, through comparative analysis, this study finds that the existing literature has the following deficiencies: firstly, most of the existing theoretical studies in China take the talent policy of specific regions or traditional industries as the object of analysis, and although they have provided a lot of theoretical basis and practical experience for reference, they have not yet paid sufficient attention to and explored in depth the attraction of talents in the high-speed and technology-intensive emerging industries of biology and new pharmaceuticals, and their specificity and complexity as well as unique requirements for the policy. Requirements have not yet received sufficient attention and in-depth discussion.

The technical barriers, market competition, and talent scarcity faced by emerging industries require their talent attraction mechanisms to be different from those of traditional industries. Secondly, although a large number of scholars have discussed the critical role of talent strategy in enhancing enterprise resilience, it is still insufficient to base the introduction of high-level talents as the core strategy for improving the resilience of regional industries and conducting systematic and theoretical research. There is relatively little existing literature on the combination of talent management and industrial resilience, and the talent theory system remains a relatively weak link in terms of building and enhancing the risk-resistant and adaptive capacity of regional industries through talent strategies.

Especially for Xinxiang City's biological and new pharmaceutical industry, as an emerging and strategic industrial cluster, its development exhibits unique characteristics, including an extreme thirst for innovative talent, a fast pace of technological updating, fierce market competition, and the external uncertainties it faces. Therefore, the existing theoretical system fails to adequately explain and guide the promotion of regional industry resilience through high-level talent attraction in this specific context. In view of this, this study aims to fill this gap by thoroughly integrating resilience theory into the study of attracting and nurturing high-level talent in the biological and new pharmaceutical industries.

By combining the actual situation and starting from the unique needs of emerging industries, the study formulates a high-level talent introduction policy that conforms to the objective law, with a view to theoretically enriching the cross-study of talent management and regional resilience construction, and practically providing talent support and resilience guarantee for the high-quality development of emerging industries in Xinxiang City and even in other regions.

Research Methods

This study aims to thoroughly analyze the effectiveness of high-level talent attraction strategies in emerging industries and their impact on industrial resilience, and to propose optimization suggestions based on this analysis. The study will primarily employ the Comparative Analysis

method, supplemented by the Social Fact Paradigm perspective, to examine the talent attraction practices of different industry types.

Comparative analysis methods

Contrastive analysis is a method commonly used in social science research, where similarities and differences between two or more objects of study are compared in specific dimensions to reveal their intrinsic patterns and influencing factors (Wardhaugh, 1970). This study will focus centrally on the differences in high-level talent attraction methods between traditional and emerging industries, and further analyse how these differences affect the construction of resilience in their respective industries. The comparative analysis of this study will be organised around the following two dimensions.

Firstly, the difference analysis of the talent attraction strategy. Traditional industries primarily include equipment manufacturing, food manufacturing, the textile industry, the chemical industry, and the building materials industry, among others. These industries typically have a long history of development, relatively mature technology, a stable market structure, and other notable characteristics. The mode of attracting and nurturing high-level talent in these industries may focus more on experienced management talent, skilled workers, traditional R&D engineers, and marketing talent. The mode of attraction may favour internal cultivation, school-enterprise cooperation for targeted cultivation, and poaching within the industry, among others. The policy incentives may focus more on remuneration and benefits, job promotion, and stable development. Secondly, emerging industries mainly include biology and new medicine, batteries and new energy, energy conservation and environmental protection, and new-generation information technology. Technological innovation, broad market prospects, rapid technological updating and fierce competition mainly characterise these industries.

The demand for high-level talents is increasingly diverse and cutting-edge, encompassing top scientists, complex R&D specialists, international business development experts, venture capital professionals, and interdisciplinary integration specialists. Attracting and nurturing methods may include global recruitment, equity incentives, project cooperation, flexible introductions, and building innovation ecosystems, among others. Policy incentives may be more focused on scientific research platforms, innovation autonomy, income from the transformation of achievements, opportunities for international exchanges, and more flexible working mechanisms (Zhang *et al.*, 2024b). This research examines both sectors through the lens of workforce requirements, recruitment approaches, motivational strategies, and governmental assistance to uncover distinctive characteristics and competitive edges that new industries possess in securing skilled professionals.

Comparative Evaluation of Talent Recruitment Frameworks and Their Influence on Sectoral Adaptability. Industry adaptability is the ability of firms in a particular type of industry to withstand perturbations, adapt to long-term changing environments and reactivate their operational capabilities as well as implement organisational changes (Duan *et al.*, 2022). The study focuses on traditional and new industries and examines how they can enhance their adaptive capacity through human capital strategies, respectively.

Overall, traditional companies will use a talent architecture centred on continuation of business, and knowledge preservation to ensure that they maintain a smooth position in the evolution of market developments; however, perhaps less so in those situations where disruptive technological innovations are required to develop rapidly. In contrast, leading companies are more likely to adopt a talent structure centred on creative thinking, a diverse set of skills and a global outlook, which enables them to respond to the vagaries and uncertainties of the marketplace, and to be more resilient, absorptive of learning, and innovative in their breakthroughs than traditional companies,

so that they can find new hope in the downturns, and organisational change can be driven more quickly.

The organisational change can be promoted more quickly. Therefore, this paper needs to conduct a systematic study on the HRM models under different categories and the degree of HRM matching under two types of industry categories, so as to examine how different types of recruited talents can contribute to the stability of different industries, and then to put forward the significance that giving full play to the guidance of optimising HRM under the optimised types can enhance the important role of innovation-driven industries in long-term stability and competitiveness. To illustrate the differences and interrelations in talent attraction strategies and their impact on industry resilience, the comparative framework is visually summarized in Figure 2 (see Figure.2).

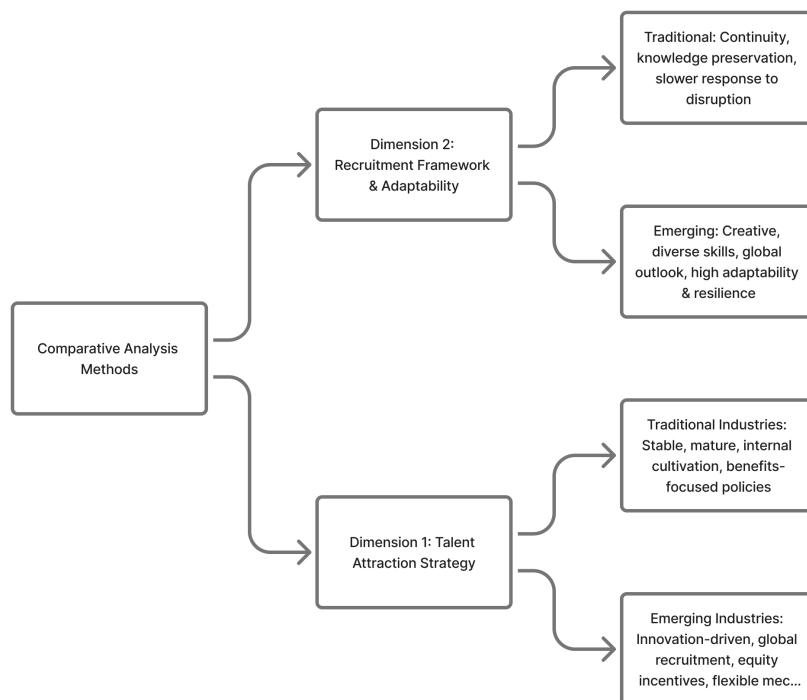


Figure 2. Comparative framework of talent attraction strategies and their impact on industry resilience in traditional and emerging industries.

Source: Proceeded by authors, 2025.

Based on Figure 2, it is evident that traditional and emerging industries adopt distinct human resource management approaches that reflect their respective operational environments and strategic priorities. Traditional industries tend to rely on structured, experience-based talent cultivation and internal knowledge preservation, which support stability but limit rapid adaptation to technological disruptions. In contrast, emerging industries leverage flexible recruitment, global talent acquisition, and innovation-focused incentives, fostering a workforce capable of driving organizational change and maintaining competitive advantage in dynamic market conditions. This comparative visualization underscores the critical role of aligning talent strategies with industry-specific demands to enhance resilience, adaptability, and long-term sustainability.

Social Facts Paradigm Research Perspectives

This paper employs the Social Fact Paradigm (SFP) framework for data collection and analysis. This paradigm stems from an examination of how social structures, rigid rules, customs, and conventions collectively influence the actions of individual actors and social groups. It thus adopts a structurally centred approach to research (Shiping Tang, 2011). More specifically, this paper examines three key social variables governing labour migration and organisational fitness: skilled worker recruitment strategies, industry entry mechanisms, and localised innovation networks.

Research into China's human capital attraction policies, scientific and technological advancement initiatives, and specialised industrial development strategies—alongside analysis of related national policies—reveals how governmental measures reflect societal realities. These directly shape talent acquisition methods, workforce cultivation approaches, and the soft environment for industry growth. This study primarily examines the functions of attracting, retaining, and cultivating high-calibre talent, alongside their impact on stable development.

Further investigation explores clusters and innovation ecosystems, analysing the primary characteristics of diverse manufacturing clusters, the foundational infrastructure for development and innovation, and shifts in collaborative-competitive relationships. Advanced manufacturing necessitates extensive and dynamic innovation ecosystems to foster innovative projects by exceptional talent—such ecosystems themselves constitute a critical factor profoundly influencing sectoral development.

The final layer of analysis concerns the innovation-centric corporate culture patterns manifested in work practices, management processes, and the industry itself. These evolving domains often foster a working atmosphere that transcends departmental boundaries, tolerates trial and error, and acknowledges failure—a crucial factor for attracting top talent and building a robust, broad-based societal foundation.

This paper employs SFP to transcend existing micro-level paradigms of talent behaviour research, instead focusing on the complex interplay between social structures, institutional arrangements, and talent attraction mechanisms, and their collective impact on industrial adaptability.

Analysed

Policy and Industrial Resilience of High-level Talents in Traditional Industries

Policies targeting skilled professionals in traditional industries have long been implemented in economically developed regions, fostering distinctive approaches. Their legal frameworks focus not only on demand and supply but also prioritise occupational specialisation. Consequently, these sectors maintain long-term stability and avoid drifting with the tide despite financial crises and competitive pressures.

This study further examines how traditional industries retain their workforce and proposes distinctive strategic approaches. The primary method for attracting technical specialists lies in simultaneously fulfilling two fundamental needs: recruitment and development (Durazzi, 2023). Most initiatives focus on specialised education dedicated to long-term training, with government incentive schemes playing a decisive role. For instance, financial specialists holding Chartered Financial Analyst (CFA) qualifications receive substantial rewards, reflecting the sector's particular regard for high-calibre credentials.

This emphasis on expertise and formal qualifications serves multiple purposes. Primarily, it ensures established production lines maintain a stable workforce of experienced employees possessing specialised knowledge. This reservoir of expertise enables companies to address

technological and market challenges with greater efficiency and capability (Autor, 2022). Experienced professionals tackle problems holistically, minimising operational disruption risks stemming from unknown variables.

The path preference of traditional organisations involves a rigorous standardisation of beneficiaries. This strict categorisation aims to ensure that policy support is directed exclusively towards senior managers possessing exceptional talent and the capacity to make significant organisational contributions – such as distinguished academics, high-calibre scientists, and technical personnel and managers driving technological advancement. Consequently, policy assistance is broadly diverted away from lower-tier job seekers holding only undergraduate qualifications.

Nonetheless, in the Talent Multiplication Plans issued by economic and technological development zones in different regions of the country, some of the policies have begun to provide rental and salary subsidies to high-level tower base talents with master's degrees. This focus on mid-level and basic professionals, although a late start, is crucial to improving the operational resilience of traditional industries. Having sufficient and stable mid-level personnel can ensure smooth day-to-day operations, respond promptly to changes in market demand, and prevent malfunctions in key links due to talent gaps.

In this study, by analyzing the focus and resilience constructs of young talent policies, the researcher has identified several phenomena. Young and middle-aged talents are surely the backbone of national rejuvenation and city building, as well as the key to maintaining the vitality of traditional industries (Ren & Chai, 2025). Policies for high-level talents in conventional industries, therefore, focus on the introduction and cultivation of young talents. The innovation and learning abilities of the young generation enable industries to absorb new knowledge and technology more effectively, and thus have a stronger ability to adjust and transform when the external environment changes.

Meanwhile, to further highlight the orientation of supporting young talents in innovation and entrepreneurship, traditional industries are primarily oriented towards experienced talents to lead innovative research. However, these policies still face challenges in attracting young technology-based entrepreneurs and young scientists to the forefront of industries and at the world's scientific and technological frontiers. For eligible young people with outstanding qualifications, although policies may relax the requirements, the actual implementation of these initiatives has made it challenging to create a strong policy tilt towards young and middle-aged talents. This lack of attraction for cutting-edge young talent may limit the resilience of traditional industries in transforming in response to disruptive innovation. If one sector fails to attract young leaders who can promptly lead the direction of future technology, it may appear passive in the face of emerging technology challenges and find it difficult to leap into high-value-added areas. Therefore, traditional industries need more attractive strategies to capture these young talents with forward-thinking and innovative vigor (Day & Schoemaker, 2000).

High-Level Talent Policies for Emerging Industries and the Construction of Industrial Resilience

In building the system of attracting and nurturing high-level talents, emerging industries show a very different strategic focus from that of traditional industries, the core of which lies in the construction of diversified platforms, the introduction of financial water and the construction of innovation carriers to comprehensively enhance the resilience of the industry, to provide it with a strong capacity for adaptation, recovery and transformation in the rapidly changing market environment.

Emerging industries enhance the adaptability and resilience of industries by attracting talent through platforms. In attracting and nurturing high-level talent, emerging industries pay special attention to the construction of platforms. As a national key brand for international high-level talent interaction and exchange, the International Elite Entrepreneurship Week for Emerging Industries focuses on project docking and negotiation as the central link, with project landing as the ultimate goal, to realize the value of attracting talent through the platform. Since its implementation, the platform has attracted more than 40,000 international high-level talents to matchmaking and achieved a 20 per cent settlement rate (An *et al.*, 2025). Through this activity platform, emerging industries have cumulatively introduced various categories of talents, including national-level major talent projects, regional dual-creation talent projects, and urban innovation and entrepreneurship leaders. Among the enterprises founded by these talents, more than 30 have annual sales exceeding 100 million yuan, and the number of enterprises selected for municipal unicorn cultivation has also accounted for approximately 30% of the city's total. By combining industrial summits and a series of supporting activities, the platform effectively gathers international and domestic scientific and technological elites.

Through this interactive platform for the introduction of high-level talents and resources for innovation and entrepreneurship, the emerging industry has driven the country to form a favourable atmosphere of respecting talents, attracting talents, and making good use of talents, by the fruitful results and vast influence it has created (Yu & Zhang, 2021). This talent attraction mode, centred on the platform, dramatically enhances the adaptability and resilience of emerging industries. The platform can quickly respond to global talent flow trends and industrial technology frontier needs, flexibly adjust the direction of talent attraction, and ensure that the industry consistently obtains the most suitable talent resources, thereby quickly adapting to external changes and seizing development opportunities.

In addition, the emerging industry has successfully formed the brand of international creator competition. After years of deep ploughing, a series of talent attraction platforms, such as International Elite Entrepreneurship Week and Winning in the Country, have basically formed a set of mature talent attraction mode. Each city also has its own brand of talent attraction, and through the superposition of high-level talent policies at various levels, the multiplier effect of talent attraction has been formed. In addition to the talent attraction platform directly created by the government, the government also attracts and builds industrial talent attraction platforms. Xinxiang City, Henan Province, China, has successfully organised more than one hundred high-end academic conferences in the field of life sciences, and has successively invited academicians and young scientists from various countries to participate in exchanges in China (Hu *et al.*, 2025). Similar industrial conference platforms introduced by the State also include the China Pharmaceutical Innovation and Investment Conference and the Intelligent Transportation World Congress, which have extensively promoted the development of key industries such as biomedicine and intelligent networked vehicles.

The construction of these multi-level and multi-dimensional platforms has built an open and dynamic talent ecosystem for emerging industries, which has significantly enhanced the industry's resilience to absorb and reconfigure in terms of talent acquisition. When there is a talent gap or technological bottleneck breakthrough in a specific field, these platforms can quickly gather the world's top wisdom, providing the industry with the possibility of rapid supplementation and strategic adjustment.

Emerging industries are empowered by financial water to enhance the resilience of industrial transformation. The sustainable development of sectors requires not only excellent technical capabilities and abundant human capital, but also continuous investment in capital. The regular operation of industries and technology research and development needs strong financial support,

and the same is true for high-level talent projects. The demand for talent projects in the capital market is diversified. For this reason, the emerging industry, in accordance with the idea of benchmarking international practice and advanced city standards, has innovatively launched a series of financial support combinations, providing financial assistance to talent innovation and entrepreneurship. These policies include the provision of unsecured up to a maximum amount of \$50 million to meet the financial needs of talent enterprises at multiple levels and to serve talents accurately (Navid, 2024). This flexible and powerful financial support can effectively reduce the financial risk of high-level talents' entrepreneurship, encourage them to transform cutting-edge technologies into actual productivity, and thus promote the transformation and resilience of emerging industries.

Through the guidance of funds, the sector can support more projects with disruptive potential, hence realizing the rapid transformation from a traditional mode to an innovation-driven one. At the same time, emerging industries have actively increased the investment scale of state-owned investment funds and explored compliant, safe, and flexible investment methods. These state-owned investment funds consider the roles of market-based decision-making and government guidance, and functionally address the inadequacies of traditional state-owned investment funds, which primarily invest in mature local projects. The fund can invest not only in high-level talent projects with industry leadership, but also in early-stage start-up projects. This flexible investment mechanism will connect more talents and projects, increasing the stickiness of high-level talents in the local area.

In addition to the government's financial support for enterprises, the State also comprehensively encourages social capital to invest in high-level talent enterprises. Social capital encompasses banks, guarantee companies, lending institutions, and investment and financing institutions that lend, guarantee, and finance businesses in return (Boudreaux *et al.*, 2022). The number of venture capital institutions and the scale of private equity funds in the country are significant. The agglomeration of financial capital and investment and financing institutions provides more operating funds for high-level talent projects at the forefront of technological research and development, or project industrialization, and creates a favorable investment and financing environment for the development of scientific and technological innovation.

Adequate and diversified financial support provides a firm backing for the innovation activities of emerging industries, so that when they face high risks of technological research and development and market fluctuations, they have stronger resilience to pressure and development, ensuring that the innovation chain is not broken, and that high-level talent projects can continue to incubate and grow.

Results and Discussion

Building a holistic strategic pattern to strengthen the foundation of systemic tolerance

From the perspective of Toughness Theory, emerging industries enhance resilience by fostering talent capable of absorbing shocks, rapidly adapting to changes, and maintaining high performance under uncertainty. This approach strengthens both organizational and systemic toughness. The system's tolerance is the cornerstone of its ability to withstand external shocks and maintain the stability of its core functions. The findings of this study suggest that to enhance the resilience of the talent system, it is essential to establish an open governance structure deeply rooted in national and global networks, through a top-level design with a holistic and forward-looking strategy.

Deep integration into the global innovation network to achieve risk diversification and allocation (Zhou & Li, 2024). If local talent strategies are confined to intra-regional circulation, they

will easily fall into passivity in the counter-current of globalisation or regional conflicts. Therefore, taking the initiative to embed regional talent nodes into the Belt and Road and other country-led global innovation networks is key to realizing the transformation from zero-sum game-style competition for talent to positive-sum game-style talent network governance. It is the key to realizing the transformation from a zero-sum game talent competition to a positive-sum game talent network governance. This open pattern, through the construction of a multi-centre and multi-channel global talent supply chain, effectively disperses the risk of chain breakage brought about by political and economic fluctuations in a single market. Unlike traditional industries, which focus on knowledge preservation and internal cultivation, emerging industries emphasize creative, interdisciplinary, and globally oriented talents, demonstrating higher systemic toughness in facing market volatility

It accurately aligns with national strategic demands and strengthens the strategic determination for resource allocation. In the context of the white-hot war for talent, local policies are easily susceptible to the trap of imitative competition, leading to resource mismatch and diminished benefits (Ye 2024). Integrating regional talent cultivation into the national framework for fostering scientific and technological innovation capabilities and technological autonomy positions it as a strategic offensive asset within this system. This ensures that scarce resources in core domains remain effectively allocated amidst complex competitive dynamics, thereby preventing the diversion of resources through the pursuit of short-term political gains. This long-term perspective and the inherently stable nature of this state- and demand-driven strategic choice enable resilience against diverse non-strategic opportunities and irregular fluctuations.

The state shall reform and safeguard a fair and equitable evaluation and reward mechanism within the system, reinforcing alignment with its core values. Fairness and justice within the system are fundamental to its proper functioning. Establishing personnel assessment and reward mechanisms centred on innovation value, capability, and performance contributions, alongside multi-tiered participation frameworks, constitutes not only vital measures for sustaining the system's vitality but also a significant driving force for its sustainable development. It serves as a stabiliser and lubricant to preserve the internal dynamics of the system. It can not only effectively stimulate the endogenous motivation of high-level talents for innovation and entrepreneurship, but also prevent and resolve internal conflicts and talent loss caused by inaccurate evaluation and unfair incentives through procedural justice and fair results.

Driving Precision and Digital Change to Enhance System Adaptive Capabilities

Adaptability is the core ability of a system to perceive changes in the environment and make timely and precise adjustments. In today's world of accelerated technology iteration and rapidly changing industrial forms, enhancing the adaptability of the talent system must rely on the accurate transmission of market signals and the comprehensive empowerment of digital technology.

Fully activate the role of the main body of the enterprise to achieve accurate perception and conduct on the demand side. Enterprises, as the primary drivers of innovation, are the most sensitive indicators of changes in market supply and demand (Oderanti *et al.*, 2021). A common dilemma in the current talent policy is the disconnection between government and market demand. Therefore, it is necessary to completely reverse the old mode of government serving dishes and establish the new paradigm of enterprise ordering dishes through system design, policy empowerment, and platform construction. Through the systematic mapping of key industrial talent, we can generate a dynamic skills demand portrait, which can clarify scattered, fuzzy talent skills needs in the micro-market, and provide a clear, quantifiable, and operable macro-policy basis.

Comprehensively build a digital governance platform to achieve supply-side agile response and empowerment. Digital technology provides a revolutionary tool for building an agile government and realising precise services (Mergel, 2016). Creating a digital talent service platform that encompasses

the entire life cycle of attracting, educating, retaining, and evaluating talent is equivalent to building a digital twin for a resilient talent system. The realization of one person, one code for talents, one key to match policies, and one network for services is not only a significant enhancement of administrative efficiency but also a more profound significance in the real-time collection, dynamic analysis, and intelligent decision-making of talent data. Based on big data analysis, the platform is able to predict the trend of talent flow, identify the risk of potential wastage, and accurately disseminate policy information, thus transforming passive responses into active foresight and sloppy management into fine governance. This data-driven, agile service capability is an inevitable choice for responding to the increasingly personalized, diversified, and dynamic needs of high-level talents, and it is also the fundamental premise for the system to adapt to the digital era.

Cultivating a market-based and globalised ecology to enhance the level of systemic resilience

Resilience is the ability of a system to quickly return to its original State or even to re-engineer its functions after a shock. A system with strong resilience is inevitably built on diversified resource channels, open global links, and an excellent integrated environment.

Build a multi-level capital market system to strengthen the system's financial resilience. The innovation and entrepreneurship support system that overly relies on government financial investment is fragile and unsustainable. Promoting the formation of a multi-level capital market support system centered on angel investment, venture capital, private equity, and industrial funds is essential for building a strong market-based system that fosters talent innovation and entrepreneurship (Mocanu & Thiemann, 2024). When a specific funding channel for a policy is tightened or disrupted, active social capital can quickly fill the gap to ensure that high-quality talent projects are not aborted due to temporary funding difficulties.

Against the backdrop of the globalised flow of talent, the competitiveness of a region depends to a large extent on its ability to attract and accommodate international talent. By systematically simplifying the work permit and residence process for foreign talent, building a well-functioning international community, and providing multilingual professional services to create an overseas-like soft environment for talent development, we are essentially expanding the regional talent system's resource pool from the domestic to the global level. When the flow of domestic talent is blocked due to specific reasons, the vast international talent market can serve as an effective alternative and supplement, preventing a break in the talent chain in key areas. This ability to deploy global resources from east to west greatly enhances the system's resilience in responding to local or phased crises.

The research should strengthen the comprehensive functional carriers of cities and build the foundation for the long-term development of talents. The decision to reside in a particular location, especially for high-level talents, is a rational choice that integrates career development, living environment, and family needs. Continuous investment in quality basic education, high-level medical services, affordable housing, green and ecological urban space, and convenient and efficient public transport is a sign of respect for the fundamental rule of voting with one's feet. The quality of these integrated urban functional vehicles constitutes the underlying attractiveness of a regional talent habitat. A city that excels in these areas will be able to retain its core of talent, even with its deep livability capital, even when its economy or industries face short-term challenges, thereby preserving the most valuable human resource spark for the next round of economic recovery and industrial upgrading.

To understand the complex relationship between talent attraction strategies and industry resilience, it is essential to examine how various elements interact within the organizational ecosystem. The diagram below visualizes the layered structure of this ecosystem, ranging from external factors such as market and industry conditions to internal elements like talent development,

innovation, and inter-unit coordination. This representation facilitates the identification of strategic intervention points that can strengthen both organizational and systemic resilience (see Figure 3),

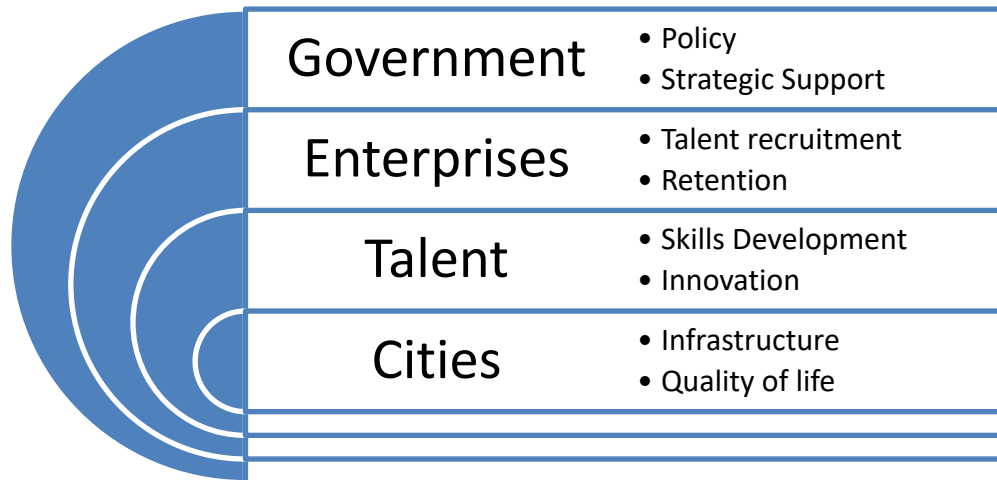


Figure 3. Layered ecosystem of organizational resilience and talent attraction, illustrating the interactions between external factors, internal capabilities, and collaborative networks.

Based on figure 3, the diagram presents a layered ecosystem illustrating how talent attraction strategies interact with organizational resilience across multiple dimensions. At the outermost layer, external factors such as market volatility, industry trends, and regulatory environments shape the strategic context in which organizations operate. The middle layer represents internal capabilities, including talent development, innovation processes, knowledge management, and operational coordination, which act as the organization's adaptive mechanisms. The innermost layer captures collaborative networks, encompassing partnerships, inter-unit cooperation, and knowledge-sharing channels, which enhance both flexibility and resource mobilization. Collectively, these layers demonstrate that resilience emerges not from isolated initiatives but from the dynamic interplay of external pressures, internal strengths, and collaborative mechanisms. By mapping these interactions, the diagram highlights potential leverage points for targeted interventions, enabling organizations to enhance their capacity to absorb shocks, adapt to unforeseen changes, and maintain high performance over time. This holistic perspective underscores the importance of integrating strategic talent management with systemic resilience planning to ensure sustainable organizational success in complex and uncertain environments.

Implications

Theoretical Contributions

The theoretical contributions of this study are mainly reflected in three aspects: firstly, it creatively applies the resilience theory, which originated from ecology and engineering, to the study of regional talent governance, expands the extension of the theory in public management and socio-economic systems, and provides a new analytical framework for understanding the dynamic behaviour of complex talent systems. Secondly, the four-in-one resilient talent system model proposed in this study reveals the synergistic mechanism of strategic planning, market mechanisms, digital ecology, and institutional innovation in shaping system resilience, thereby deepening the understanding of the inherent laws of talent governance. Finally, the study views innovation as the advanced dimension of resilience, emphasizing that the talent system should not only possess the

capacity for passive defense and adaptation, but also have the ability to actively lead change, thereby enriching the connotation of resilience theory.

Practical Implications

At the practical level, this study provides clear action guidelines for local governments. It warns that the mode of financial competition that relies solely on increasing settlement fees and project subsidies is no longer sustainable, and the competition between regions is shifting to a comprehensive ecological competition centred on system resilience. Policymakers should make the following shifts: from administrators to governance network builders, committed to building a synergistic pattern of government, enterprises, universities and social institutions; from policymakers to system providers and platform operators, focusing on the construction of fair rules of the game and efficient empowerment platforms; and from resource allocators to creators of an innovative atmosphere, with the focus on fostering the cultural soil that encourages innovation, tolerates failures, and is open and tolerant.

Conclusions and Future Prospects

Despite the results of this study, several limitations remain, and these limitations point the way for future research. Firstly, it involves the quantitative measurement and empirical testing of the resilience system. This study mainly conducted theoretical constructs and qualitative analyses. Future research can be devoted to developing a set of operationalized indicator systems and using structural equation modeling, social network analysis, and other econometric methods to horizontally compare and vertically assess the resilience of the talent system in different regions, so as to rigorously empirically test and revise the theoretical model proposed in this paper. Secondly, it is the study of industrial heterogeneity and organisational microfoundations. This study mainly argues from the regional macro level. However, there are significant differences in the knowledge base, innovation model, and talent structure of different emerging industries, and the resilience attributes they require should also be different. Finally, there is the balance between the tension between talent security and openness under globalisation. Against the backdrop of the current anti-globalisation trend and intensified geopolitical conflicts, countries are increasingly tightening their security control over high-end talents and key technologies.

Future research faces a central challenge. How to safeguard the openness of international mobility of talents and avoid going towards closure and rigidity under the premise of guaranteeing the security of national talents and the autonomy and control of core technologies? This requires an in-depth exploration of the dynamic balance mechanism that guarantees security in openness and promotes openness under security, and the study of how to build a new pattern of double-cycle talent development that not only has a strong internal recycling capacity, but also can deeply participate in and lead the external international recycling, which will be a cutting-edge topic for future research on talent governance.

Funding

Xinxiang Municipal Government Decision-making Research Bidding Topic "Research on Mechanism of Introducing and Cultivating High-level Talents for Bio- and New-pharmaceutical Strategic and Emerging Industries in Xinxiang City" (Project No.:B24088) .

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could be perceived to influence the work reported in this paper.

Acknowledgement

This work was supported by the Xinxiang Municipal Government Decision-making Research Bidding Topic, 'Research on the Mechanism of Introducing and Cultivating High-level Talents for Bio- and New-pharmaceutical Strategic and Emerging Industries in Xinxiang City' (Project No.: B24088).

References

- An, Jiang, Neiat, Yeoh, Venayagamoorthy, & Zaslavsky. (2025). A Comprehensive Review on IoT Marketplace Matchmaking: Approaches, Opportunities and Challenges. *ACM Comput. Surv.*, 57(8), 213. <https://doi.org/10.1145/3715904>
- Autor. (2022). *The labor market impacts of technological change: From unbridled enthusiasm to qualified optimism to vast uncertainty*.
- Bambi, & Pea-Assounga. (2025). Unraveling the interplay of research investment, educational attainment, human capital development, and economic advancement in technological innovation: A panel VAR approach. *Education and Information Technologies*, 30(3), 3309-3341. <https://doi.org/10.1007/s10639-024-12938-y>
- Boudreaux, Clarke, & Jha. (2022). Social capital and small informal business productivity: the mediating roles of financing and customer relationships. *Small Business Economics*, 59(3), 955-976. <https://doi.org/10.1007/s11187-021-00560-y>
- Dahmen. (2023). Organizational resilience as a key property of enterprise risk management in response to novel and severe crisis events. *Risk Management and Insurance Review*, 26(2), 203-245. <https://doi.org/10.1111/rmir.12245>
- Day, & Schoemaker. (2000). Avoiding the Pitfalls of Emerging Technologies. *California Management Review*, 42(2), 8-33. <https://doi.org/10.2307/41166030>
- Duan, Madasi, Khurshid, & Ma. (2022). Industrial structure conditions economic resilience. *Technological Forecasting and Social Change*, 183, 121944. <https://doi.org/10.1016/j.techfore.2022.121944>
- Durazzi. (2023). Engineering the expansion of higher education: High skills, advanced manufacturing, and the knowledge economy. *Regulation & Governance*, 17(1), 121-141. <https://doi.org/10.1111/rego.12439>
- Getnet, Pfeifer, & MacAlister. (2014). Economic incentives and natural resource management among small-scale farmers: Addressing the missing link. *Ecological Economics*, 108, 1-7. <https://doi.org/10.1016/j.ecolecon.2014.09.018>
- Goldin, & Katz. (2020). *The Incubator of Human Capital: The NBER and the Rise of the Human Capital Paradigm*.
- Hu, Liu, & Tang. (2025). Flexible recruitment of overseas talent. *Scientometrics*, 130(8), 4397-4422. <https://doi.org/10.1007/s11192-025-05379-y>
- Jia, Zhang, & Pan. (2022). Scientific and technological innovation, industrial structure upgrading, and High-Quality economic development. *China Economic Transition= Dangdai Zhongguo Jingji Zhuanxing Yanjiu*, 5(3), 388-407. <https://doi.org/10.3868/s060-014-022-0018-0>
- Liu, Si, & Li. (2023). Research on the Effect of Regional Talent Allocation on High-Quality Economic Development—Based on the Perspective of Innovation-Driven Growth. *Sustainability*, 15(7), 6315. <https://doi.org/10.3390/su15076315>

- Manuelli, & Seshadri. (2014). Human Capital and the Wealth of Nations. *American economic review*, 104(9), 2736–2762. <https://doi.org/10.1257/aer.104.9.2736>
- Mergel. (2016). Agile innovation management in government: A research agenda. *Government Information Quarterly*, 33(3), 516–523. <https://doi.org/10.1016/j.giq.2016.07.004>
- Mocanu, & Thiemann. (2024). Breeding ‘unicorns’: Tracing the rise of the European investor state in the European venture capital market. *Competition & Change*, 28(3-4), 433–453. <https://doi.org/10.1177/10245294231204984>
- Navid. (2024). Proposing strategies to address the challenges emerging from recruitment and acquiring talent-a study on Trust Bank PLC. 3, 1–24. <https://doi.org/10.2139/ssrn.5315023>
- Oderanti, Li, Cubric, & Shi. (2021). Business models for sustainable commercialisation of digital healthcare (eHealth) innovations for an increasingly ageing population. *Technological Forecasting and Social Change*, 171, 120969. <https://doi.org/10.1016/j.techfore.2021.120969>
- Ren, & Chai. (2025). Resilience Renewal Design Strategy for Aging Communities in Traditional Historical and Cultural Districts: Reflections on the Practice of the Sizhou'an Community in China. *Buildings*, 15(6), 965. <https://doi.org/10.3390/buildings15060965>
- Schuler, Jackson, & Tarique. (2011). Global talent management and global talent challenges: Strategic opportunities for IHRM. *Journal of World Business*, 46(4), 506–516. <https://doi.org/10.1016/j.jwb.2010.10.011>
- Shiping Tang. (2011). Foundational Paradigms of Social Sciences. *Philosophy of the Social Sciences*, 41(2), 211–249. <https://doi.org/10.1177/0048393109355294>
- Sobel. (1978). The human capital revolution in economic development: its current history and status. *Comparative Education Review*, 22(2), 278–308. <https://doi.org/10.1086/445982>
- Teixeira. (2014). Gary Becker's early work on human capital – collaborations and distinctiveness. *IZA Journal of Labor Economics*, 3(1), 12. <https://doi.org/10.1186/s40172-014-0012-2>
- Thunnissen, & Van Arensbergen. (2015). A multi-dimensional approach to talent: An empirical analysis of the definition of talent in Dutch academia. *Personnel Review*, 44(2), 182–199. <https://doi.org/10.1108/pr-10-2013-0190>
- Wang, & Sun. (2018). Talent Development in China: Current Practices and Challenges Ahead. *Advances in Developing Human Resources*, 20(4), 389–409. <https://doi.org/10.1177/1523422318802591>
- Wardhaugh. (1970). The contrastive analysis hypothesis. *Tesol Quarterly*, 6, 123–130. <https://doi.org/10.2307/3586182>
- Wu, & Kao. (2022). Mapping the Sustainable Human-Resource Challenges in Southeast Asia's FinTech Sector. *Journal of Risk and Financial Management*, 15(7), 307. <https://doi.org/10.3390/jrfm15070307>
- Yazdizadeh. (2025). *Digital organs without bodies: on algorithmic capitalism and its consequences* [University of British Columbia].
- Ye (2024). Tracing the Origin and Creating the Future to Find the Lost Dimension of Nature in Modern Education: The Second Follow-up Study of Life-Practice Educology. *ECNU Review of Education*, 2(5), 450. <https://doi.org/10.1177/20965311241227450>
- Yu, & Zhang. (2021). Innovation strategy of cultivating innovative enterprise talents for young entrepreneurs under higher education. *Frontiers in Psychology*, 12, 693576. <https://doi.org/10.3389/fpsyg.2021.693576>
- Zhang, Ding, Xue, Han, & Liu. (2024a). Building success: the impact of talent recruitment on the growth of the construction industry. *Engineering, Construction and Architectural Management*, 8, 1–34. <https://doi.org/10.1108/ecam-11-2023-1213>
- Zhang, Ding, Xue, Han, & Liu. (2024b). Building success: the impact of talent recruitment on the growth of the construction industry. *Engineering, Construction and Architectural Management*, 4, 1–23. <https://doi.org/10.1108/ecam-11-2023-1213>

Zhou, & Li. (2024). R&D team network configurations, knowledge diversity and breakthrough innovation: a combined effect framework. *European Journal of Innovation Management*, 28(6), 2285-2303. <https://doi.org/10.1108/ejim-11-2023-1004>

Author's Bio

Zhang Liangfei, male, born on June 26, 1989, Master of Business Administration, Lecturer, Teacher of North Henan Medical University. His main research areas include human resource development, organizational development, labor economics, and others. He has published two articles in international journals. Email: 925358903@qq.com, ORCID: <https://orcid.org/0009-0001-2380-6715>

Huang Yuxi is a researcher in the Health Management Department at North Henan Medical University, Xinxiang City, China, with an ORCID ID [0009-0008-4197-5249] and can be contacted at 549236288@qq.com.