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Research on Policy Synergy and Governance Structure Optimization of Industry-Education Integration from the Perspective of Government-School-Enterprise Synergy

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Abstract: Driven by the reform of vocational education and the transformation and upgrading of industries, the integration of industry and education has become a key link in the national innovation system, however, the fragmentation of policies and the imbalance of governance rights and responsibilities in the government, school and enterprise synergy have seriously restricted its effectiveness. This paper takes government-school-enterprise synergy as the research perspective, comprehensively applies policy network theory and collaborative governance theory to systematically deconstruct the interactive logic of policy synergy and governance structure in the integration of industry and education, and discusses the current dilemmas of the integration of industry and education in depth. It is found that the synergistic dilemma of the integration of industry and education stems from the heterogeneity of the institutional logic of multiple subjects, the asymmetry of the distribution of power and responsibility, and the continuous constraint of historical institutional inertia. In view of the above problems, this paper proposes a four-pronged optimization framework of “system-interest-information-region” to help the integration of industry and education transform from “formal synergy” to “substantive governance”.

1. Introduction

The report of the 20th National Congress of the Communist Party of China included vocational education in the education modernization strategy, emphasizing the deepening of the integration of industry and education. In 2024, the policy revision will focus on building a collaborative education mechanism of "government co-ordination, industry guidance, enterprise participation, and school subjectivity". In the face of industrial intelligent transformation, the "Manufacturing Talent Development Planning Guide" shows that the talent gap rate in key areas will reach 48% in 2025, and it is urgent to promote the deep integration of the education chain and the industrial chain. The integration of industry and education can effectively solve the problem of mismatch between supply and demand of talents through the integration of government, school and enterprise resources, but there are still bottlenecks such as insufficient policy coordination and low governance efficiency in

practice, and it is necessary to build a two-wheel drive mechanism of "policy-governance" to promote the systematic connection between education supply-side reform and industrial upgrading.

2. Explanation of the connotation of policy coordination and governance structure

2.1. Policy coordination

As the core mechanism of collaborative governance, "policy coordination" emphasizes that multiple actors form a coordinated and complementary linkage mechanism through target integration, tool adaptation and resource co-ordination in the process of policy formulation and implementation, so as to improve policy effectiveness and governance synergy. Peng Jisheng, Zhong Weiguo et al. [1], were the first scholars in China to carry out targeted research on this issue, taking technological innovation policy as a case to make exploratory research on policy quantification, and proposed that policy coordination is "a coordinated state formed by policy subjects through complementary tools and unified goals". Some scholars believe that policy coordination needs to improve policy effectiveness through a holistic governance mechanism, such as building an operational framework that integrates information sharing, benefit compatibility, and institutional guarantee [2]. This paper focuses on the framework of government-university-enterprise collaboration in the integration of industry and education, and defines policy coordination as the dynamic adjustment of government planning, university education reform and enterprise industrial policy.

2.2. Governance structure

As an important framework for achieving policy coordination, the governance structure emphasizes the responsibility boundaries of each subject and the rational design of the coordination mechanism, so as to ensure the effective participation and collaboration of multiple subjects in policy coordination. In the field of governance structure, scholars mostly focus on the interaction of multiple actors and the allocation of rights and responsibilities [3][4].Taking the Guangdong-Hong Kong-Macao Greater Bay Area as an example, Yue Jinglun emphasized the institutionalized design of cross-domain collaboration, and proposed that the governance structure is "a co-governance framework formed by the government, the market and society through the allocation of rights and responsibilities and the integration of resources". Zeng Dongsheng et al. pointed out in the research on the integration of industry and education in vocational education that the core of the governance structure lies in the division of rights and responsibilities of "government co-ordination, school subject, and enterprise coordination", and it is necessary to resolve the main conflict through a dynamic negotiation mechanism. Huang Dong further proposed that the improvement of governance effectiveness depends on the "mutual embeddedness of policy networks and collaborative governance theories", that is, the integration of policy tools needs to match organizational carriers (such as regional councils) to achieve institutional implementation [5]

3. Analysis of the current situation of policy coordination and governance structure of the integration of industry and education

3.1. Current status at the level of policy coordination

3.1.1. Lack of practical policy guarantees and supporting systems

At present, in the process of promoting the integration of industry and education in China,

although the policy has clarified the rights and responsibilities of multiple subjects such as the government, industry, enterprises, and schools from the macro level, due to the slow progress of the construction of supporting systems, there is a lack of hard constraints in the actual implementation. This situation focuses on three aspects: first, the defects of the contract mechanism: the school-enterprise agreement is overly dependent on self-discipline, and the lack of government supervision leads to "hot agreement and cold implementation"; Second, the incentive policy is invalid: the lack of key links such as financial subsidy rules and intellectual property rights confirmation systems weakens cooperation expectations; Third, there is a lack of dynamic supervision: the time lag in policy implementation and the lack of cross-departmental coordination restrict the sustainable development of the integration of industry and education [6].

3.1.2. Lack of policy coordination and difficulty in cross-departmental coordination

There are three institutional obstructions in the policy of integration of industry and education: first, there is the fragmentation of departmental coordination: education, human resources and social security, industry and other departments have multiple policies, and the cross-conflict of policies raises the institutional transaction cost of university-enterprise cooperation; Then, the effectiveness of tools is blocked: the functional standard leads to the weakening of the linkage of policy instruments, and the cooperation has long been stuck in the "point-to-point" case level, making it difficult to make the transition to a large-scale institutional model. Finally, there is the lack of stability in implementation: local policies change frequently with personnel changes, which induces the instability of enterprise expectations and the inertia of resource dependence of schools, and exacerbates the risk of resource misallocation.

3.2. The current situation at the level of governance structure

3.2.1. The dynamic mechanism is missing, and the distribution of benefits is unbalanced

As a rational economic person, enterprises face the structural contradiction between long-term investment in human capital and short-term returns: the high-cost-high-risk characteristics drive them to prefer the immediate supply of talents recruited by the society rather than participate in the in-depth coordination of the education chain. At present, the integration of industry and education mostly stays in the shallow cooperation of "school training and enterprise use", and it is difficult for enterprises to substantially intervene in the core links of education such as curriculum design and ability standards, resulting in a structural dislocation between talent supply and enterprise demand. The deeper crux lies in the lack of institutional response to the demands of enterprises, such as the ambiguity of intellectual property ownership and the vacuum of cost-sharing mechanisms, which continue to inhibit the main momentum of enterprises, forming a governance dilemma of "hot schools and cold enterprises".

3.2.2. There is a mismatch between the supply and demand of talents, and the lack of pertinence in collaborative education

The integration of industry and education aims to achieve the fit between talent training and demand, but the current situation is not optimistic. Many colleges and universities only start from their own standpoint, and do not fully consider the needs of enterprises and the upgrading and changes of local economic and industrial structure. This makes it difficult for enterprises to passively and perfunctory participate in the integration of industry and education, and it is difficult to give full play to their own advantages, and the results of the integration of industry and education also deviate from the actual needs of enterprises. The government departments have not given full

play to their leading role in this, and have not yet built a "three-in-one" collaborative education model under the leadership of the government. In addition, the major setting of some colleges and universities deviates greatly from the regional economy and industrial structure, which is difficult to meet the urgent demand of enterprises for talents. Studying the root cause, colleges and universities have a vague positioning, too much emphasis on knowledge transfer, and lag behind and detachment from reality in terms of professional setting and curriculum design, resulting in a low fit, weak relevance, and weak pertinence between the collaborative education mechanism of industry-education integration and the actual needs of enterprises [7].

4. The root cause analysis of policy coordination and governance structure imbalance

4.1. Target heterogeneity of multiple agents

In China's policy system for the integration of industry and education, the government, as the policy leader, takes the "public interest" as the starting point, and pays more attention to the scale effect and social benefits of the integration of industry and education.

The core of market-oriented entities lies in the short-term returns of economic benefits and technological innovation, so they are more inclined to choose low-cost and short-term cooperation projects, and are cautious about long-term investment such as talent training. The school follows education-oriented, emphasizing the sustainability of discipline construction and talent training, thus ignoring the new needs of the market, which further exacerbates the disconnection with market demand. The heterogeneity of the three goals makes the policy objectives appear fragmented, and this conflict of goals will directly lead to the fact that it is often difficult for the government to be compatible with the profit-seeking nature of enterprises and the conservative nature of schools when carrying out macro planning, resulting in the structural contradiction of enterprises choosing "symbolic participation" due to cost considerations, and the difficulty of colleges and universities to meet the high requirements of enterprises for technological innovation due to training design, and finally making policy implementation inefficient.

4.2. The ambiguity and asymmetry of the distribution of rights and responsibilities

In the governance structure of the integration of industry and education, the confusion in the distribution of responsibilities and powers between the government, universities and enterprises is often caused by the ambiguity of role positioning. On the one hand, there is an obvious asymmetry in the boundaries of power and responsibility between the government, enterprises and schools. In some school-enterprise cooperation, the government not only requires enterprises to provide practical resources, but also does not clearly define their specific responsibilities for talent training, and schools bear the dual pressure of connecting teaching management with enterprise needs. This lack of clarity of rights and responsibilities makes enterprises tend to avoid long-term investment and choose low-risk, short-term cooperation projects instead, while schools find it difficult to restrain corporate behavior due to the lack of policy support, and finally form a vicious circle of "responsibility idling". On the other hand, the lack of vertical coordination between central and local policies further exacerbates the asymmetry of the distribution of power and responsibility. Central policies are usually guided by macro goals, while local governments often adopt a "selective implementation" strategy due to resource constraints and assessment pressure in the implementation process, and the "last mile" problem is generally faced in the implementation of policies.

5. Policy coordination and governance structure optimization framework from the perspective of government-school-enterprise collaboration

5.1. Institutional Guarantee and Enforcement Mechanism

The formulation of special laws and regulations is the core path to solve the lack of policy coordination and loose governance structure in government-school-enterprise coordination. At present, the policy of integration of industry and education mostly exists in the form of departmental rules or local documents, and there is a lack of high-level laws to rigidly restrict the boundaries of rights and responsibilities of the government, universities, enterprises and other subjects, so that in the implementation of the policy, there are often problems such as government overstep intervention, passive adaptation of colleges and universities, and ambiguity of corporate responsibility. Therefore, it is urgent to promote special legislation, clarify the leading responsibilities of the government, the main obligations of universities, and the scope of rights of enterprises, and build a legal framework of "equal rights and responsibilities and risk sharing".

Constructing an efficient policy implementation system and a scientific supervision and evaluation mechanism is the key to solving the problem of "policy idling" in government-school-enterprise collaboration. First, provincial and even national-level implementation agencies for industry-education integration policies should be established to vertically connect the central and local governments and horizontally link education, industry, finance and other sectors of industry-education integration, so as to form a synergistic network for policy implementation. Secondly, a supervision and evaluation framework covering the whole process should be constructed. In terms of index design, in addition to traditional indicators such as the number of enterprises participating and the employment rate of students, quantitative indicators of governance structure dimensions such as policy coordination, resource integration efficiency, and depth of subject participation are included.

5.2. Interest coordination and incentive mechanisms

The government, universities and enterprises, as the three main bodies of the integration of industry and education, have significant differences in their interest demands, and if there are no clear rules for the distribution of interests, it is easy to lead to the dilemma of "emphasizing form over substance" or "one party dominates" in cooperation. Colleges and universities often pay attention to the improvement of teaching and scientific research capabilities and the transformation of achievements, enterprises pay more attention to technological upgrading and cost-benefit balance, and the government pursues the public benefits of regional economic development and talent supply. The significant differences in the interests of the three parties are mainly determined by their own nature, which makes the sharing path of the interests of the three parties must be clarified through institutional design. At the same time, a dynamic compensation mechanism is set up for the asymmetry of interests that may occur in cooperation to stimulate the sustainable motivation of all parties to participate deeply. As a market-oriented entity, the motivation for enterprises to participate comes from the controllability of costs and the predictability of benefits. In view of the problems of high investment risk and long return cycle commonly faced by enterprises, a multi-level incentive policy system can be built to solve them realistically.

5.3. Information sharing and communication mechanisms

At present, the information asymmetry between government policy guidance, the dynamics of talent training in colleges and universities and the technical needs of enterprises can be improved by

building a unified information sharing platform. The government can release special support policies for the integration of industry and education through the platform, colleges and universities can update major settings and graduate information in real time, and enterprises can dynamically feedback the needs of technical research and job gaps, forming a data closed loop of "policy-education-industry" of government, school and enterprise. On this basis, big data and cloud computing technology are introduced to further optimize the design of regional industrial talent demand trends and cross-regional resource scheduling. The other side of information sharing is to face the protection of information data security and trustworthiness. For information security, data encryption, security awareness training and other methods can be used to ensure the tampering and traceability of sensitive information such as cooperation agreements, so as to reduce the risk of cooperation and enhance the confidence of all parties to participate.

The establishment of a normalized and diversified communication and coordination mechanism is the key support to ensure the long-term operation of government-school-enterprise coordination. On the one hand, it is necessary to organize regular meetings with the participation of government, school and enterprises in an institutionalized manner, and clarify the meeting level, topic scope and specific process of the meeting, so as to avoid discussion without decision. On the other hand, other forms of communication such as industry forums and industry-university-research seminars will be held to promote the in-depth interaction between the government, schools and enterprises in their respective specific fields, and to enhance the on-the-spot exchanges and trust accumulation between enterprises and universities. Adhere to the dual-track model of formal mechanisms to ensure the bottom line and informal channels to supplement, gradually promote the programmatic solution of key problems and further stimulate the innovation vitality of flexible collaboration, and promote the upgrading of government-school-enterprise cooperation from "passive response" to "active co-creation".

5.4. Regional coordination and resource allocation mechanism

To solve the contradiction between inter-regional policy fragmentation and redundant construction, it is necessary to promote cross-regional policy coordination with systematic thinking. For cross-regional collaboration, the first step is to clarify the functional positioning of each region, and different regions should clarify their own development attributes. At the same time, the rationality of the regional division of labor should be regularly assessed, and dynamic adjustments should be made in a timely manner according to the needs of industrial chain upgrading to ensure that policy coordination is not rigid. On this basis, the government further plays the role of "matchmaking", constantly improves the dialogue mechanism between the government, enterprises and universities, clarifies the contradictions between various subjects and coordinates, so that all subjects reach a consensus, and stimulates the endogenous power of inter-regional coordinated development, so as to promote the integration of industry and education from "single-point breakthrough" to "global coordination"[8].

In the process of promoting the integration of industry and education, the construction of an efficient resource allocation system is the core path to alleviate the structural contradiction of the integration of industry and education. First of all, it is necessary to comprehensively analyze the resource demand and supply situation in the integration of industry and education, and based on this, establish a resource allocation mechanism, integrate multiple resources, and achieve accurate matching of supply and demand through big data and cloud computing. At the same time, we will actively explore the establishment of a resource trading platform covering a variety of transaction types to promote the market-oriented flow of resources, so as to improve the efficiency and effectiveness of resource utilization. Construct a "demand-oriented, value-driven" resource

allocation model, and accelerate the integration of industry and education to truly become the glue for regional coordinated development[9].

6. Conclusion

Driven by the reform of vocational education and industrial transformation and upgrading, the integration of industry and education has become a key path to solve the problem of "two skins" of talent training and industrial demand. From the perspective of government-school-enterprise collaboration, this study systematically deconstructs the interactive logic of policy coordination and governance structure in the integration of industry and education, reveals the deep root cause of the current collaboration dilemma, and proposes an optimization framework of "system-interest-information-region" in one, which provides theoretical support and practical path for the integration of industry and education from "formal coordination" to "substantive co-governance".

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