International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 3: May-June 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

# Industry-Education Integration Policies in China's Vocational Education: A Bibliometric Analysis of Current Status and Development Trends

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Received 07/10/2024 Revised 11/10/2024 Accepted 11/11/2024

**Abstract**
**Background and Aim:** Since the introduction of the industry-education integration concept in China's vocational education policies in 2013, numerous policies have been issued to enhance collaboration between educational institutions and industries. This study aims to fill gaps in understanding how these policies are implemented by analyzing the tools used and the roles of various entities in shaping policy implementation.
**Materials and Methods:** A total of 56 policy documents from the Beida Fabao database, issued since 2013, were analyzed using NVivo software for text coding. Policy instruments were categorized into authority-based, incentive-based, capacity-building, and others. The frequency and distribution of these tools were quantitatively assessed, along with the roles of different entities.
**Results:** The analysis shows a steady increase in policy documents, primarily from educational and industrial departments. Capacity-building and incentive-based tools were most frequently used, while authority-based tools appeared in pivotal policies. These differences reflect diverse strategies employed by the entities involved.
**Conclusion:** While significant progress has been made in policy formulation, challenges remain, such as coordination issues and unequal resource allocation. The study recommends more integrated strategies to enhance the alignment of education and industry, ensuring that the intended policy objectives are fully realized in practice.
**Keywords:** Industry-Education Integration; Policy Instruments; Vocational Education; Textual Analysis

## Introduction

Industry-education integration has become a key focus in the ongoing development of China's vocational education system. The concept of industry-education integration was first formally introduced in the 2013 "Decision of the Central Committee of the Communist Party of China on Major Issues Concerning Comprehensively Deepening Reforms," which emphasized the need to accelerate the construction of a modern vocational education system, deepen industry-education integration and school-enterprise cooperation, and cultivate highly skilled workers. Since then, the Chinese government has issued numerous policies aimed at strengthening collaboration between educational institutions and industry. Despite the extensive policy efforts, there remains a gap in understanding the implementation of these policies, particularly in terms of the roles of different entities and the effectiveness of various policy instruments.

While previous studies have laid the groundwork for analyzing industry-education integration, many lack systematic exploration, especially regarding how different policy tools, such as authority-based, incentive-based, and capacity-building tools, are applied and their impact on policy implementation. This paper seeks to fill that gap by conducting a bibliometric review of policy documents issued after 2013, uncovering the development trends and policy instruments used to promote industry-education integration in vocational education. By analyzing the frequency and distribution of policy tools used by different issuing entities, this study highlights both the progress made and the ongoing challenges, such as the coordination issues among government departments.

## Literature Review

### *Concept of Industry-Education Integration*

Industry-education integration is an educational model that closely links vocational education with industry demands. Its goal is to promote synergy between education and industry development, enhance the quality of skilled talent training, and foster mutual benefits between education and the economy. In this model, vocational education not only serves as a place for knowledge transmission but also requires in-


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depth collaboration with enterprises and industries. This is achieved through school-enterprise cooperation and joint education programs, which help improve students' practical skills and enhance their competitiveness in the job market. Studies show that effective school-enterprise partnerships play a crucial role in aligning vocational training with industry needs, fostering hands-on experience for students, and bridging the gap between theoretical knowledge and practical application. For instance, Ford (2008) noted that aligning educational outcomes with industry needs through collaboration between educational institutions, industries, and research bodies is crucial to enhancing students' practical abilities and adaptability to industry demands. This model emphasizes the need for continual interaction between academia and industry to ensure that graduates are equipped with the skills necessary to thrive in a rapidly changing workforce(Ford, 2008).

***Current Research on Industry-Education Integration: Research Trends in China***

Scholars in China have primarily focused on the interpretation of policies, implementation pathways, and case studies related to industry-education integration. With the continuous advancement of national policies, there is growing interest in how vocational education can enhance students' employability and professional skills through industry-education integration. Li & Xue (2022) highlight that the successful implementation of industry-education integration hinges on close collaboration between educational institutions and enterprises, supported by local governments through tailored policies and funding mechanisms. This collaboration is essential for aligning educational programs with industry demands, fostering skill development, and ensuring sustainable partnerships. Local governments play a pivotal role by offering legal, financial, and infrastructural support to ensure the effectiveness and long-term sustainability of such cooperation (Li & Xue, 2022). Additionally, Xue & Li (2022) analyzed cases of vocational education and school-enterprise cooperation across various regions in China, highlighting significant regional differences in implementation, closely linked to local economic conditions, industrial structures, and government policies. Their study underscores how economic disparities between regions impact the effectiveness of school-enterprise collaborations, particularly in aligning vocational education with local industry needs (Xue & Li, 2022).

***International Research Trends***

Globally, the concept of industry-education integration is often aligned with "Work-Integrated Learning" (WIL) or "Cooperative Education," particularly in the context of vocational and higher education. Smith and Worsfold (2015) demonstrated that Work-Integrated Learning (WIL) effectively enhances students' practical abilities and employability, and has been widely adopted in the vocational education systems of developed countries, particularly in Europe and North America. Their research highlights how integrating academic learning with real-world work experience bridges the gap between theory and practice, providing students with critical skills needed in the workforce(Smith & Worsfold, 2015). Similarly, Jackson (2018) conducted a cross-national study comparing cooperative education models in Australia and New Zealand, finding that these models systematically improve students' employment adaptability and technical skills through structured collaboration between educational institutions and industry(Jackson, 2018).

While research in various regions may differ in practical application, both perspectives emphasize the importance of deep cooperation between education and industry as a means to enhance the quality of talent cultivation and economic competitiveness. Studies from different contexts tend to focus on either policy-level analysis or the practical application of educational models and their impact on students (Lester & Costley, 2010).

***Literature Evaluation***

The existing literature provides a broad discussion on industry-education integration, but there is still room for improvement in terms of theoretical depth and critical analysis. The current literature lacks an in-depth exploration of core theories such as policy tool theory, which is crucial for explaining the practical implementation of industry-education integration. Additionally, much of the research focuses on policy implementation without sufficient critical comparison, particularly when analyzing the effects of policies across different regions. The impact of regional economic disparities on policy implementation has not been adequately addressed.



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## Objectives

This study aims to conduct a comprehensive analysis of policy documents related to industry-education integration in China's vocational education system since 2013. The research seeks to explore the evolution of these policies over time, focusing on key aspects such as the number of policies issued, the roles and contributions of different issuing entities, and the specific application of policy instruments. By employing policy tool theory and utilizing NVivo for systematic text coding, this study will examine the frequency, distribution, and effectiveness of different policy instruments, such as authority-based, incentive-based, and capacity-building tools, in the context of industry-education integration. Additionally, the research will analyze how these tools are applied across various policies and issuing entities, identifying their effectiveness in promoting the integration of vocational education and industry.

The ultimate goal of this research is to identify and analyze the strengths and limitations of current policies, offering evidence-based recommendations for future policy optimization. By doing so, the study seeks to contribute to the development of a more cohesive and practical framework for industry-education integration, thereby enhancing the quality of vocational education and improving its alignment with industry needs.

## Methodology

### *Data Collection and Analysis*

This study collected 56 policy documents related to industry-education integration from the Beida Fabao database, covering policies issued since 2013. These documents were selected based on specific criteria, including relevance to industry-education integration, issuing date post-2013, and availability in the Beida Fabao database. The search was conducted using keywords such as industry-education integration and vocational education, and the documents were screened using inclusion/exclusion criteria to remove those irrelevant to the study. This ensured that the documents chosen were directly related to the research topic and provided a comprehensive view of the policy landscape. The policy tool theory was applied to categorize the tools into authority-based, incentive-based, capacity-building, symbolic, and system change-based categories. These categories were chosen because they provide a structured framework for analyzing the different approaches used by policymakers to promote industry-education integration. Policy tool theory is particularly relevant in this context as it allows for the systematic evaluation of how various tools influence the effectiveness of policy implementation. Alternative frameworks, such as policy implementation theory, were considered but rejected because the focus of this research is on the tools themselves rather than the broader implementation process. Using NVivo software, the texts were systematically coded to identify the frequency and application of these policy tools. NVivo was chosen for its ability to handle large volumes of qualitative data and its capability to systematically categorize and analyze text data. Other potential software options, but NVivo was preferred due to its user-friendly interface and comprehensive text analysis features.

### *Analysis of Issuing Entities and Policy Tools*

The study also analyzed the roles of various issuing entities, examining the distribution of policy documents among central and local governments, educational institutions, and industrial departments. The distribution of policy tools was examined to understand how different entities utilized them to promote industry-education integration. By applying NVivo to conduct the textual analysis, the research highlighted trends in how these tools were distributed and utilized, particularly in terms of their frequency and the types of entities that employed them. The analysis of issuing entities was crucial in identifying how central and local governments, along with educational and industrial bodies, played distinct roles in shaping the integration process.

### *Explanation of Policy Tool Categories*

The policy tools were categorized into five types. Authority-based tools: These involve directives and regulations enforced by the government or higher authorities to mandate certain actions.Incentive-based tools: These provide financial or other incentives to encourage the desired behavior from institutions or industries. Capacity-building tools: These focus on developing the resources, skills, and infrastructure



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needed to implement policies effectively. Symbolic tools: These are used to signal priorities or values without necessarily enforcing compliance. System change-based tools: These involve broader reforms aimed at overhauling systems or structures to foster long-term integration. This categorization provides a clear framework for analyzing how different tools are applied across policy documents. It was chosen to ensure that the analysis captures the full spectrum of strategies employed in promoting industry-education integration.

***Ethical Considerations***

Although this study is based on secondary data, it adhered to ethical standards by ensuring that all policy documents were obtained from publicly accessible and legally available sources, such as the Beida Fabao database. Intellectual property rights were respected, and no confidential or sensitive information was included in the analysis.

## Results and Discussion

***Analysis of the Number of Industry-Education Integration Policy Documents Issued (2013-2024)***

This section presents an analysis of the number of policy documents related to industry-education integration issued from 2013 to 2024. The data were collected from the Beida Fabao database using the keyword industry-education integration in a full-text search.

Analyzing the number of documents issued is a crucial part of this study, as it aims to reveal the development trends of industry-education integration policies since their formal introduction in 2013. By tracking the annual number of policy documents, we can directly observe the government's increasing emphasis on industry-education integration and the changing intensity of policy implementation. The fluctuations in the number of documents reflect the national focus on vocational education reform and serve as an indirect indicator of the policy's promotion and execution efforts. In particular, as industry-education integration has become a key strategic direction in vocational education in recent years, the growing number of documents suggests ongoing governmental efforts to deepen the integration between education and industry.

The purpose of this section is to provide contextual support for subsequent analyses, helping us better understand the application of policy tools and the roles of different issuing entities in advancing industry-education integration. The table below shows the number of policy documents issued each year from 2013 to 2024, highlighting key trends in policy activity related to industry-education integration (data collected as of August 2024).

**Table 1** Number of Policy Documents on Industry-Education Integration Issued from 2013 to 2024

| Year | Number of Documents Issued |
|---|---|
| 2013 | 10 |
| 2014 | 17 |
| 2015 | 51 |
| 2016 | 50 |
| 2017 | 73 |
| 2018 | 92 |
| 2019 | 125 |
| 2020 | 138 |
| 2021 | 139 |
| 2022 | 104 |
| 2023 | 98 |
| 2024 | 41 |



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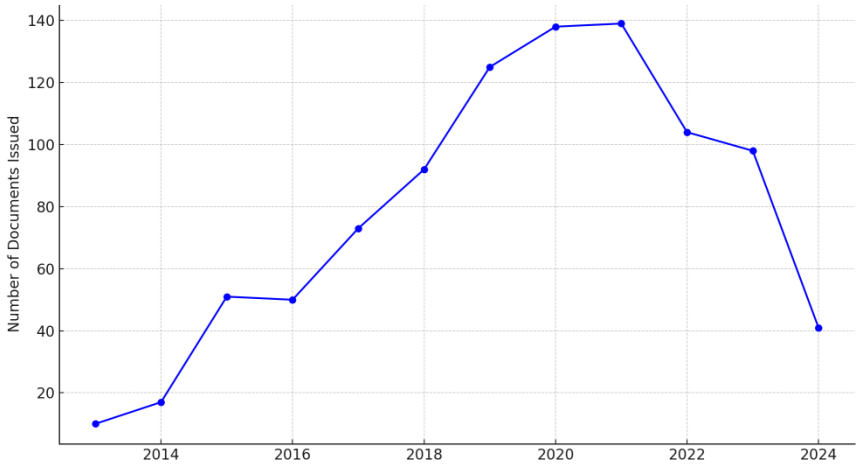


**Figure 1** Trends in the Number of Industry-Education Integration Policy Documents Issued (2013-2024)

The line chart above illustrates the trends in the issuance of policy documents related to industry-education integration from 2013 to 2024. Based on the data analysis, several key observations can be made. Between 2013 and 2019, there was a significant upward trend, with the number of policy documents increasing from 10 in 2013 to 125 in 2019. This sharp growth reflects the government's increasing focus on integrating vocational education with industry, through active policy issuance to promote deeper collaboration between educational institutions and enterprises. The peak in 2020 and 2021, with 138 and 139 documents respectively, marks the most intensive phase of policy creation. This surge likely correlates with broader educational and economic reforms, indicating a stronger emphasis on enhancing the vocational education system. Additionally, the COVID-19 pandemic's impact on the labor market may have prompted the government to introduce more policies to align education with industry, adapting to evolving market demands.

Following this peak, the data shows a gradual decrease in the number of issued documents, dropping to 104 in 2022, 98 in 2023, and significantly down to 41 by August 2024. However, it is important to note that the 2024 data only covers up to August, and the number of documents issued later in the year is yet to be accounted for, which may lead to changes in the overall trend. The decline in document issuance could suggest that the main policy frameworks had been established in earlier years, reducing the need for frequent new policies. It may also reflect a shift in focus from policy formulation to the implementation and evaluation of existing policies. The decreasing number of documents indicates a shift in the policy development stage, with the government possibly focusing more on assessing the effectiveness of earlier policies to ensure their successful execution. Overall, this trend reflects the dynamic evolution of industry-education integration policies, revealing the government's shifting priorities and the external factors influencing vocational education policy development over time.

***Analysis of the Issuing Entities for Industry-Education Integration Policy Documents***

This section provides an analysis of the various entities responsible for issuing policy documents related to industry-education integration. The data showcases the contributions made by different governmental bodies, including the National People’s Congress, the State Council, and other institutions. A detailed breakdown is also provided for specific departments under the State Council, such as the Ministry of Education and the Ministry of Science and Technology. By examining the number of documents issued by each entity, we can gain insights into the relative involvement and focus of different institutions in promoting industry-education integration policies. This analysis highlights which governmental bodies are most active in shaping the policies that guide the collaboration between education and industry.



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**Table 2** Issuing Entities and the Number of Policy Documents Issued

| Issuing Entity | Number of Documents |
|---|---|
| National People's Congress | 19 |
| Standing Committee of the NPC | 5 |
| State Council | 48 |
| Supreme People's Court | 1 |
| Supreme People's Procuratorate | 1 |
| State Council Institutions | 789 |
| Party Central Committee Organs | 45 |
| Other Institutions | 141 |

**Table 3** Detailed Breakdown of the State Council Institutions and the Number of Policy Documents Issued

| Issuing Entity | Number of Documents |
|---|---|
| General Office of the State Council | 27 |
| Various Ministries | 663 |
| Ministry of Foreign Affairs | 3 |
| Ministry of Education | 368 |
| Ministry of Science and Technology | 38 |
| Ministry of Public Security | 7 |
| Ministry of State Security | 1 |
| Ministry of Civil Affairs | 16 |

Tables 2 and 3 present the issuing entities responsible for policy documents related to industry-education integration, along with detailed data. Table 2 lists the number of documents issued by various entities, including the National People's Congress, the State Council, the Supreme People's Court, and departments under the Party Central Committee. The data shows that the institutions under the State Council lead in terms of policy issuance, with a total of 789 documents, significantly higher than any other entity. Following that, other institutions issued 141 documents, while the Party Central Committee departments issued 45 documents, indicating their involvement in policy formulation.

Table 3 provides a more detailed breakdown of the issuing entities under the State Council from Table 2. It lists the number of documents issued by specific departments, such as the General Office of the State Council, various ministries, the Ministry of Education, and the Ministry of Science and Technology. The various ministries issued a total of 663 documents, reflecting their central role in policy development. The Ministry of Education, as the primary department overseeing vocational education, issued 368 documents, highlighting its pivotal role in industry-education integration policy. Other departments, such as the Ministry of Science and Technology and the Ministry of Public Security, issued fewer documents, but still demonstrate the importance of cross-departmental collaboration in policy development.

In combining the analysis of these two tables, we can see the key role played by the State Council and its associated departments in driving industry-education integration policies. The various ministries and the Ministry of Education, in particular, have been instrumental in shaping policy documents, emphasizing the strategic importance of integrating vocational education with industry. The ministries play a crucial role in aligning vocational education with industry needs through extensive policy issuance, ensuring the comprehensiveness and enforceability of the policies. Meanwhile, the Ministry of Education actively promotes vocational education reforms through policy formulation, providing strong policy support for advancing education-industry integration. Other departments, such as the Ministry of Science and Technology and the Ministry of Civil Affairs, also contribute, particularly in areas of cross-departmental coordination and policy support.

The data from Tables 2 and 3 clearly illustrate that the State Council and its institutions are the primary forces behind the development of industry-education integration policies. This demonstrates the



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government's commitment to fostering collaboration between education and industry, while also reflecting the diversified and systematic approach to policy-making. The collaboration between different government departments ensures the comprehensiveness and long-term effectiveness of policies designed to integrate vocational education with industry demands.

***Analysis of Policy Text Coding and Statistics***

Policy provisions serve as the fundamental unit for the content analysis in this study. A systematic coding process was applied to 56 selected policy documents, categorizing and marking the content of policy tools according to the format "Policy-Provision-Serial Number" to form the content analysis coding table (see Table 4). During the coding process, if a policy provision involved multiple policy tools, the "*" symbol was used for distinction. Due to space limitations, only a portion of the coded policy provisions is displayed in the table.

The purpose of coding these policy provisions is to reveal the frequency and distribution characteristics of various policy tools used in industry-education integration policies. This analytical approach helps clarify the actual roles that policy tools play in policy formulation and implementation, providing quantitative data to assess policy effectiveness. Coding not only refines the specific application scenarios of policy tools but also identifies which policy tools are most frequently used to promote the integration of vocational education and industry, offering empirical evidence for future policy optimization.

This coding and statistical analysis of policy provisions allows for a systematic examination of policy texts and a deeper understanding of the actual application of policy tools. By quantitatively analyzing the frequency and distribution of different policy tools, we can better grasp the logic behind policy design and assess the actual outcomes of policy implementation. This process provides crucial empirical data for future policy research and offers decision-making insights for promoting deeper integration between vocational education and industry.

**Table 4** Content Analysis Coding Table for Vocational Education Industry-Education Integration Policy Texts (Partial Excerpt)

| No. | Policy | Excerpt of Policy Content Analysis | Code | Tool Type |
|---|---|---|---|---|
| 1 | The decision of the State Council on Accelerating the Development of Modern Vocational Education (Guofa [2014] No.19) | Integration of industry and education, characteristic school operation, highlighting the characteristics of vocational schools, and strengthening school-enterprise collaboration in education. | 1-1-4 | Symbolic and Persuasion-based Tools |
| | | Vocational colleges should closely cooperate in industry-university-research collaboration. | 1-2-5 | Authority-based Tools |
| | | Establish a system for enterprise participation, formulate relevant laws and incentive policies to promote collaborative schooling, deepen industry-education integration, encourage industries and enterprises to establish or participate in vocational education, and play a key role in school operations. | 1-3-10 | System Change-based Tools, Incentive-based Tools |



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| No. | Policy | Excerpt of Policy Content Analysis | Code | Tool Type |
|---|---|---|---|---|
| 2 | Notice of the Ministry of Education, National Development and Reform Commission, Ministry of Finance, Ministry of Human Resources and Social Security, Ministry of Agriculture, and State Council Poverty Alleviation Office on Issuing the "Modern Vocational Education System Construction Plan (2014-2020)" (Jiaofa [2014] No. 6) | Strengthen industry guidance, evaluation, and services. Industry organizations should fulfill their responsibilities in publishing talent demand, promoting school-enterprise cooperation, participating in educational guidance, and conducting quality evaluations. | 1-3-11 | Authority-based Tools |
| | | Adhere to school-enterprise cooperation, work-study combination, implement project-based teaching, case-based teaching, and work-process-oriented teaching methods. Innovate internship models, and actively promote the "double certificate" system of academic certificates and vocational qualification certificates. Conduct joint enrollment and training under the modern apprenticeship system, promoting integrated school-enterprise education. | 1-4-15 | Capacity-building Tools |
| | | Implement the teacher enterprise practice system. The government should support schools in autonomously hiring part-time teachers according to relevant regulations. Promote the establishment of dual-qualified teacher training bases co-established by high-level schools and large or medium-sized enterprises. | 1-4-17 | Capacity-building Tools |
| | | Persist in the development of industry-education integration. Promote the alignment of professional setup with industrial demand, curriculum content with occupational standards, and teaching processes with production processes. | 2-2-3 | System Change-based Tools |
| | | Increase the proportion of part-time vocational education, and develop flexible forms of vocational education such as work-study alternation, dual system, apprenticeship, part-time learning, and distance education. | 2-3-3 | Capacity-building Tools |
| | | Systematically build a training system ranging from secondary vocational education, associate degree, undergraduate, to professional degree graduate education to meet the educational needs of technical and skilled talent at all levels. | 2-3-4 | System Change-based Tools |



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| No. | Policy | Excerpt of Policy Content Analysis | Code | Tool Type |
|---|---|---|---|---|
| | | The group-based development of vocational education is an important realization of the government-led, industry-guided, and enterprise-participated vocational education system, playing a significant role in promoting the organic integration of the education chain and the industrial chain. | 2-4-4 | System Change-based Tools |
| | | Integrate work-study throughout the vocational education teaching process, gradually achieving an organic connection between employment demand and talent cultivation. Conduct pilot projects for the joint enrollment and training of apprenticeships in enterprises, with the conditions to do so. | 2-4-8 | Capacity -building Tools |
| | | Encourage enterprises and vocational schools to carry out various forms of cultural practice activities. | 2-4-8* | Symbolic and Persuasion-based Tools |
| | | Implement the autonomy of vocational schools in personnel management, encouraging them to hire corporate managers, engineers, and skilled craftsmen as full-time or part-time teachers, to national regulations. | 2-4-10 | System Change-based Tools, Capacity -building Tools |
| | | Rely on high-level schools and large or medium-sized enterprises to establish "dual-qualified" vocational education teacher training bases. | 2-4-10* | Capacity -building Tools |
| | | Plan and establish several technical skill accumulation and innovation platforms that closely cooperate between enterprises and vocational schools. | 2-5-5 | System Change-based Tools |
| ... | ... | ... | ... | ... |
| 56 | Ministry of Human Resources and Social Security, Central Organization Department, Central Cyberspace Administration of China, National Development and Reform Commission, | Deepen industry-education integration, support industries, enterprises, vocational schools, vocational training institutions, public training bases, and master studios to strengthen the training of innovative and practical digital skills talent. | 56-2-2 | System Change-based Tools, Capacity -building Tools |



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| No. | Policy | Excerpt of Policy Content Analysis | Code | Tool Type |
|---|---|---|---|---|
| | Ministry of Education, Ministry of Science and Technology, Ministry of Industry and Information Technology, Ministry of Finance, National Data Bureau on Issuing the "Action Plan for Accelerating the Training of Digital Talent to Support the Development of the Digital Economy (2024-2026)" (Renshebufa [2024] No. 37) | Accelerate industry-university collaboration to foster talent. | 56-2-5 | System Change-based Tools |
| | | Deepen the integration of industry, education, and research, supporting universities, research institutions, and enterprises in jointly cultivating interdisciplinary digital talent. | 56-3-1 | System Change-based Tools, Capacity-building Tools |

**Table 5** Statistical Table of Policy Tools Used in Vocational Education Industry-Education Integration Policies

| Policy Tool Type | Frequency | Percentage |
|---|---|---|
| Authority-based Tools | 13 | 3.76% |
| Capacity-building Tools | 112 | 32.37% |
| Incentive-based Tools | 53 | 15.32% |
| System Change-based Tools | 166 | 47.98% |
| Symbolic and Persuasion-based Tools | 2 | 0.58% |

The combined analysis of Table 4 and Table 5 indicates that vocational education industry-education integration policies focus on systemic change and capacity building, reflecting a strategic intent to drive deep structural reforms. On a deeper level, the distribution of policy tools reveals a shift from traditional, authority-dependent governance towards more flexible and adaptive management mechanisms in promoting industry-education integration.

First, the high frequency of system change-based tools (47.98%) suggests that policymakers recognize that single policies or isolated reforms are insufficient to address the complex relationship between modern vocational education and industry demands. The use of system change tools extends beyond the reform of educational institutions to include industrial restructuring, deep cooperation between enterprises and schools, and fundamental transformations in educational models. The widespread use of these tools indicates the government's aim to establish long-term mechanisms and systemic designs that ensure sustained promotion and optimization of industry-education integration policies in practice. For example, policies promoting "integrated school-enterprise education" and pilot projects for "modern apprenticeships" are typical examples of system change tools in practice. These policies aim to break down traditional barriers between education and industry and establish closer, more interactive relationships. Secondly, the high proportion of capacity-building tools (32.37%) underscores the government's emphasis on enhancing the capabilities of all stakeholders involved. This focus not only involves improving the operational capacity of educational institutions but also strengthening the role of enterprises in education. The frequent mention of policies supporting enterprises, vocational schools, and related institutions in areas such as teacher training, facility construction, and curriculum development demonstrates the government's intention to empower partners to ensure the effectiveness of industry-education integration. For instance, the government's support for building training bases for "dual-qualified" teachers, with



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contributions from high-level schools and enterprises, reflects a long-term plan and investment in capacity building. Although incentive-based tools (15.32%) are less widely applied than system change and capacity-building tools, their significance should not be overlooked. The role of incentive-based tools is to encourage enterprises and educational institutions to participate actively through rewards and penalties. For example, policies provide financial incentives, tax benefits, and other forms of support to encourage enterprises to participate in vocational education, even assuming part of the responsibility for talent training. This helps to address the low participation rate of enterprises in the traditional education model. The use of incentive-based tools in industry-education integration aims to stimulate active involvement from all stakeholders, ensuring the smooth implementation of policies and promoting the efficient allocation of educational and industrial resources. In contrast, the relatively low usage of authority-based tools (3.76%) indicates that policies rely more on negotiation and cooperation rather than mandatory orders. This shift reflects policymakers' recognition of the complexity of industry-education integration and the need for multi-stakeholder collaboration. Successful integration of vocational education and industry requires deep cooperation across departments and among various stakeholders, and coercive measures often fail to achieve the desired long-term effects. Thus, the government prefers to employ other tools to mobilize resources and encourage active participation. The minimal use of symbolic and persuasion-based tools (0.58%) suggests that in industry-education integration policies, policymakers place greater emphasis on practical actions and outcomes rather than relying solely on rhetoric or symbolic gestures. This also shows that policy formulation and implementation tend to be pragmatic, focusing on institutional design and resource investment to achieve the true integration of education and industry.

In summary, the data from Tables 4 and 5 not only reveal the surface distribution of policy tools in vocational education industry-education integration but also reflect the overall strategy employed by the government in promoting these policies. By placing significant emphasis on systemic change and capacity building, supplemented by appropriate incentive mechanisms, policymakers aim to create a sustainable system for industry-education integration. In this system, the government, enterprises, and educational institutions each play their respective roles, achieving collaborative cooperation through policy guidance while ensuring that all stakeholders have the resources and capabilities to implement the policies. This multi-tool approach demonstrates policymakers' deep understanding of the complexities involved and their long-term planning for the future.

## Conclusion

### *Focus on Systemic Change and Capacity Building*

Vocational education industry-education integration policies have made significant progress in systemic reform and capacity building, as reflected in the frequent use of system change-based tools (47.98%) and capacity-building tools (32.37%). These policies aim to establish long-term, sustainable mechanisms for collaboration between education and industry. Through initiatives like modern apprenticeships and dual-qualified teacher training programs, students and educators have been better prepared to meet labor market demands. However, regional disparities in policy implementation have emerged, especially in resource-limited remote areas, where the execution of these policies often falls short of expectations. Research indicates that there are significant differences in the effectiveness of capacity-building efforts across different regions, with under-resourced areas facing challenges in implementing these tools, thereby weakening the overall impact of the policies. These disparities highlight the need for tailored capacity-building approaches based on local contexts and resources (Endale et al., 2020). Therefore, the success of policy implementation depends not only on the design of the tools but also on the local capacity to execute them.

### *Collaborative and Flexible Governance Approach*

The governance model in vocational education industry-education integration policies has gradually shifted toward collaboration and flexibility. The lower reliance on authority-based tools (3.76%) combined with the use of incentive-based tools (15.32%) reflects this trend. This approach fosters interaction and cooperation between educational institutions and enterprises through negotiation and collaboration.



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However, Christensen and Lægreid (2008) highlighted that inter-departmental coordination is essential for effective policy implementation(Christensen & Lægreid, 2008). However, many policies encounter obstacles due to unclear roles and communication breakdowns between departments. This issue has been frequently identified in various studies, where poor communication between departments has led to weakened policy execution and hindered the achievement of policy goals. Improving inter-departmental coordination and ensuring consistency in policy application is crucial for addressing these challenges moving forward.

***Comprehensive Participation and Coordination Across Government Entities***

Various government departments, particularly the State Council and its ministries, have played a critical role in advancing vocational education industry-education integration. The high volume of policy documents issued reflects these entities' leadership in policy formulation and implementation. However, coordination between local and central governments in policy execution remains a challenge. In some cases, local policies have not fully aligned with national directives, leading to inconsistent outcomes in policy implementation. Research shows that local governments often fail to meet national policy expectations due to inadequate resource allocation or insufficient implementation efforts. Studies highlight that this issue is commonly linked to a lack of intergovernmental coordination and disparities in resource distribution, particularly in regions with weaker economic infrastructures, which leads to gaps in policy execution (Christensen & Lægreid, 2008). Therefore, further strengthening the coordination between local and central governments is crucial for effective policy implementation.

## Recommendations

The findings of this study have highlighted several issues within China's vocational education industry integration policies, particularly in terms of regional disparities, coordination challenges, and policy implementation inconsistencies. Addressing these challenges requires not only identifying the problems but also exploring effective solutions that can help improve the outcomes of these policies.

***Addressing Regional Disparities in Policy Implementation***

To resolve the regional disparities in implementing capacity-building initiatives, it is essential to tailor policies to the unique needs and resources of different regions. One effective solution is to develop targeted capacity-building programs for under-resourced areas, ensuring that vocational institutions in rural and remote regions receive adequate financial and technical support. These programs could include increased funding for infrastructure, teacher training, and industry partnerships specifically focused on these disadvantaged areas. Additionally, establishing regional development centers that act as hubs for sharing resources and best practices could improve the capacity of local institutions (Hanushek et al., 2011). Policymakers must also consider creating performance-based funding models that incentivize local governments and institutions to prioritize the effective implementation of industry-education integration reforms. To address the regional disparities in policy implementation, it would be beneficial to establish specific support programs targeted at under-resourced regions. For example, regional audits or assessments could be conducted to identify the most pressing needs in these areas, followed by the development of tailored strategies to meet them. Such initiatives could include capacity-building programs, financial incentives, or resource-sharing frameworks designed to support regions that face significant challenges in aligning industry-education integration policies with local capabilities.

***Improving Inter-Departmental Coordination***

Effective implementation of industry-education integration policies requires seamless coordination between various government departments. One solution to this challenge is to establish formal coordination mechanisms, such as inter-agency task forces or committees, which are responsible for overseeing the execution of policies across different departments. These task forces would facilitate clearer communication, reduce overlapping responsibilities, and ensure that all departments work towards common goals. Another solution is to introduce digital platforms that allow for real-time data sharing and monitoring of policy implementation, enabling government bodies to track progress and identify issues early on (Mergel et al., 2019). In addition, it would be beneficial to provide training programs for government



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officials involved in policy execution, focusing on improving collaboration skills and fostering a culture of shared responsibility. Additionally, improving coordination between government departments could be facilitated by the creation of formal inter-departmental committees or task forces. These entities could regularly review the progress of policy execution, troubleshoot issues, and promote more cohesive action among different governmental bodies. Leveraging technological tools, such as shared digital platforms or real-time tracking systems, could further enhance transparency and communication between departments.

***Enhancing Central-Local Government Collaboration***

Strengthening the alignment between central and local governments is essential to ensure that national policies are effectively implemented at the local level. One possible solution is to establish stronger feedback mechanisms, where local governments can regularly report on the progress and challenges of policy implementation. This would allow central authorities to offer tailored support and adjust national policies where necessary to better fit local contexts. Additionally, setting up regional policy hubs that act as intermediaries between the central government and local authorities could improve communication and resource allocation. These hubs could serve as platforms for local governments to collaborate, share insights, and access support from national policymakers (Li, 2010). Clearer guidelines on how local governments should interpret and apply national policies would also reduce inconsistencies in policy implementation.

***Promoting Equity in Resource Distribution***

Ensuring that all regions, particularly rural and remote areas, have equitable access to the resources necessary for implementing industry-education integration policies is crucial. One solution is to increase targeted funding for disadvantaged areas, specifically aimed at improving the infrastructure and human resources of vocational institutions. Furthermore, creating public-private partnerships could help bring in additional resources and expertise, particularly in areas where local governments face financial constraints. Private sector engagement through incentives could enhance the willingness of businesses to invest in local vocational institutions, providing both funding and opportunities for practical, on-the-job training for students (Fazekas & Burns, 2012).

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