

International Experience and Implications for the Cultivation of Childcare Professionals from the Perspective of Industry-Education Integration

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Abstract: High-quality childcare services are of paramount importance for individual development, social equity, and the construction of a national public service system, with the cultivation of high-caliber professionals in the childcare field at its core. Coincidentally, as a catalyst for achieving synchronous development between vocational education and societal progress, the industry-education integration can drive institutional innovation in the training of childcare professionals, serving as the key pathway to address the talent shortage and quality bottlenecks in this industry. Therefore, from the perspective of industry-education integration, there is an urgent need for a systematic exposition and theoretical clarification of the connotative value in the training of childcare professionals. Furthermore, by conducting an in-depth analysis of childcare professional training systems built on industry-education integration mechanisms in the United States (cooperative education), Japan (industry-education-government integration), and Germany (dual system), this study systematically dissects their successful measures, including institutional logic, core elements, and operational paradigms. Based on this analysis, it offers insights such as government-led construction of a collaborative system, universities empowering and deepening talent cultivation, and enterprises laying the foundation to connect educational pathways. These insights provide international examples for the cultivation of high-quality childcare talent and the high-quality development of childcare services.

1. Introduction

High-quality childcare services not only profoundly influence an individual's lifelong development trajectory, but also serve as a foundational pillar for alleviating family childcare pressures, promoting social equity, and fostering sustainable development. They are also a key indicator of the effectiveness of a nation's public service system. Childcare professionals, as the core element of the childcare service system, directly determine the quality and effectiveness of childcare services. Therefore, cultivating high-quality childcare professionals has become an

indispensable strategic focal point for achieving the supply of inclusive and high-quality childcare services. The Chinese government has deeply recognized the contemporary significance of high-quality childcare service development and the core value of cultivating high-quality professional talent. Since 2019, the State Council's General Office issued the *Guidelines on Promoting the Development of Infant Care Services for Children Under Three Years of Age*, which explicitly emphasized deepening school-enterprise cooperation to align childcare professional talent cultivation with industry needs; By 2025, the National Health Commission's *Notice on Conducting a National Childcare Service Quality Improvement Campaign (2025-2027)* emphasized strengthening the construction of professional childcare talent teams from aspects such as implementing institutional norms and innovating growth mechanisms to enhance the safety and standardization of childcare services. This clearly demonstrates the high priority the state places on building a new ecosystem for the cultivation of professional childcare talent that deeply integrates education and industry. However, a review of the current state of professional childcare talent team building in China reveals that there are still challenges in the implementation and effectiveness of policies ^[1], an incomplete higher education talent cultivation system, and insufficient school-enterprise integration ^[2] and other structural challenges, leading to inconsistent quality of childcare institution staff and severely constraining the optimization of overall childcare service quality. In contrast, developed countries such as the United States, Japan, and Germany have accumulated mature experience in the field of childcare professional talent cultivation. Based on this, the study focuses on systematically deconstructing the institutional logic, and operational paradigms of the childcare professional talent cultivation systems in the United States, Japan, and Germany, which are built upon the mechanism of industry-education integration. This provides China with profound theoretical insights and practical references for childcare professional talent cultivation under the framework of industry-education integration, thereby supporting the intrinsic development of China's childcare services.

2. The connotative value of cultivating talents in childcare programs from the perspective of industry-education integration

Industry-education integration is a key measure for China to build itself into a powerhouse in education, science and technology, and talent. ^[3] It also serves as the core mechanism for achieving collaborative innovation between vocational and higher education and for promoting the cultivation of modern talent. ^[4] Specifically, it involves industrial stakeholders consisting of industries and enterprises, as well as educational stakeholders including schools and teachers. These two parties integrate and align production with education, covering five core dimensions: talent cultivation models, school-running systems, school-running conditions, education and teaching, and related institutional development. ^[5] The aim is to cultivate high-quality technical and skilled talents who can adapt to contemporary industrial development, ultimately serving the dual objectives of industrial upgrading and enhancement of educational quality. Meanwhile, the cultivation of high-quality childcare professionals stands as the fundamental guarantee for achieving high-quality development in childcare services, which is crucial for advancing the grand goal of long-term and balanced population development. Industry-education integration can drive institutional innovation in cultivation of childcare professionals, serving as the core pathway to address talent shortages and quality bottlenecks in industry. By restructuring childcare talent cultivation standards and innovating talent cultivation models, it facilitates the synergy between school-based training and industry practice, thereby achieving the social goal of “providing high-quality care for young children”.

3. International experience in cultivating childcare talents from the perspective of industry-education integration

The “cooperative education” model in the United States, the “industry-education-government integration” model in Japan, and the “dual system” model in Germany have effectively achieved the cultivation of high-quality childcare professionals through their distinctive collaborative education mechanisms and systematic designs. Fully drawing on their successful experiences provides valuable international examples for China to construct a new ecosystem of industry-education integration and forge new pathways for cultivating childcare professionals.

3.1 The “cooperative education” model in the United States

The “cooperative education” model in vocational education of the United States, centered around the concept of “alternating work and study”, actively responds to the practical demands for high-quality childcare professionals in the context of high-quality development of childcare services.

3.1.1 Systematic legislation provides institutional guarantees for the talent cultivation system

The federal government has established a multi-tiered and sustainable system for cultivating childcare professionals through systematic legislation, which takes a legal framework as its cornerstone, financial support as its driving force, and multi-party collaboration as its linkage, providing systematic institutional guarantees. On one hand, the comprehensive legal framework clarifies funding directions and requirements for school-enterprise collaborative training. For instance, the *Child Care and Development Block Grant Act* provides substantial annual funding to states specifically for cultivating childcare professionals in universities and colleges.^[6] On the other hand, the legal system ensures regional practice coordination and service quality improvement, effectively addressing the issue of the disconnect between theory and practice in traditional education. For example, the California state government has established the Program Quality Rating and Improvement and Improvement System.^[7]

3.1.2 Deep school-enterprise integration empowers the construction of a scientific talent cultivation model

The “cooperative education” model in the United States drives the diversification of practical training modes through institutionalized deep school-enterprise integration, thereby achieving bidirectional empowerment between the cultivation of childcare professionals and industry development. Firstly, the institutionalization of school-enterprise collaborative cultivation enables enterprises to deeply participate in the entire process of cultivating childcare professionals through various forms, such as “enterprise experts participating in curriculum development” and “embedding vocational qualification certification into teaching”. Secondly, a range of alternating practical models, including work-study alternation and enterprise incubation, have gradually emerged during the process of deep school-enterprise integration. Among them, the work-study alternation model focuses on theoretical learning and practical reflection, emphasizing the practicality and reflexivity of knowledge. This has led to the creation of initiatives such as the Summer Bridge and Early Academic Language Model, which provide practical platforms for students on campus.^[8] Finally, relying on an “innovative community with complementary school-enterprise resources”, bidirectional empowerment through deep school-enterprise integration is achieved by restructuring cultivation objectives, curriculum systems, and evaluation criteria, thereby facilitating precise alignment between the education chain and the industrial chain.

3.1.3 Collaborative development of a competency-based modular curriculum system by multiple stakeholders

The concept of competency-based education has had a profound impact on vocational talent cultivation in the United States. Through in-depth collaboration among multiple stakeholders, including government, universities, enterprises, and industry associations, a competency-oriented modular curriculum system has been constructed. This system combines flexibility, practicality, and industry relevance, highlighting the complementary functions and shared responsibilities of diverse stakeholders. Firstly, the government entrusts professional organizations to develop industry competency frameworks. For instance, the National Association for the Education of Young Children (NAEYC) has developed certification standards for childcare professionals, deconstructing occupational competencies into six major modules, such as Child Development Theory and Family-Community Collaboration, and forming a quantifiable evaluation indicator system.^[9] Secondly, universities and enterprises collaboratively participate in the development of modular courses. Based on standard documents, childcare occupational competencies are broken down into observable indicators and teaching modules, achieving precise alignment between occupational competencies and teaching content. Finally, the modular certification and assessment system emphasizes that students must pass course assessments at universities and practical certifications at partner institutions to earn credits, ultimately achieving the integration of academic qualifications and vocational qualifications.^[10]

3.2 The “industry-education-government” model in Japan

The “industry-education-government” model, with the government as the core driving force, universities as the intellectual engine, and enterprises as the practical platform, has fostered a collaborative ecosystem for cultivating childcare professionals. This model effectively supports the efficient development of Japan’s childcare workforce and provides a systematic reference for China in establishing a government-university-enterprise collaborative training mechanism.

3.2.1 Government-led facilitation of a diversified systematic collaboration model

Based on the “industry-university-government” model, the Japanese government plays a pivotal and leading role in the collaborative process of cultivating childcare professionals. Through policy support and systematic management, it fundamentally drives the systematic collaboration among diverse stakeholders, including industry, universities, and government entities. On one hand, the government actively guides and encourages enterprises and universities to engage in bidirectional talent cultivation activities by providing financial investments, tax incentives, and other favorable conditions to facilitate their in-depth cooperation. On the other hand, the government has established a systematic childcare service management framework, characterized by high standards and stringent requirements for childcare institutions, thereby compelling enterprises and universities to engage in profound collaboration.

3.2.2 University intellectual support optimizes the holistic talent cultivation mechanism

As the core engine for knowledge creation and talent development, universities leverage their abundant intellectual resources and research-education strengths to systematically construct and optimize a collaborative talent cultivation mechanism that spans the entire process of childcare professional training. This provides crucial intellectual support for enhancing the quality of childcare services. Firstly, universities actively align with national regulations and industry demands to dynamically optimize their childcare curriculum offerings. By integrating practical

learning with theoretical instruction, they cultivate talent that meets corporate requirements, ^[11] as exemplified by initiatives like the Early Childhood Care and Lifelong Learning Program. Secondly, universities establish Joint Research Centers or Industry-Education Integration Promotion Agencies as hubs for integrating industry and education. Concurrently, they collaborate with governments, industry associations, and childcare certification bodies to establish off-campus practical training and internship bases. Thirdly, universities extend their intellectual support into the post-employment service chain. Research findings are swiftly translated into content for in-service training courses and practical guidance resources, enhancing the forward-looking and scientific nature of childcare professional training. Additionally, universities develop and offer multi-tiered, high-quality continuing education courses and degree advancement programs to meet the rigid demands for knowledge and skill updates among childcare practitioners. ^[12]

3.2.3 Deep integration of industry-university-research spurs an efficient mechanism for technology transfer and commercialization

The “industry-university-government” model establishes a deeply coupled mechanism through an institutionalized collaborative framework among industry, universities, and research institutions. This framework is underpinned by legal safeguards, centered on cooperation among key stakeholders, and catalyzed by professional intermediaries, forming a closed-loop mechanism that spans from knowledge innovation to practical application and commercialization. Firstly, the government takes the lead in enacting laws such as the *University Technology Transfer Promotion Act*, the *Research Exchange Promotion Act*, and the *Basic Act on Intellectual Property Rights*. These legal measures provide robust support for the formation of an industry-university-research innovation mechanism and facilitate the transfer and commercialization of research outcomes during the collaborative innovation process. Secondly, the in-depth participation of multiple stakeholders has fostered an efficient mechanism for technology transfer and commercialization. Universities and enterprises leverage industry-education integration platforms to achieve full-process coupling in research and development. For instance, universities and enterprises jointly establish and share laboratories, ensuring real-time alignment between research directions and industrial needs, thereby substantially enhancing the efficiency of technology industrialization. Lastly, to bridge the information gap between universities and enterprises, specialized intermediary organizations play a pivotal role in connecting the two. For example, organizations such as the Science and Technology Agency and the Small and Medium Enterprise Agency facilitate enterprises’ access to cutting-edge technologies by announcing childcare technology development projects. This enables innovative breakthroughs in the childcare sector to rapidly penetrate the market.

3.3 The “dual system” model in Germany

The “dual system”, as the cornerstone of vocational education in Germany, integrates theoretical learning with practical skills training in a profound manner, maintaining the traditional strengths of dual collaboration between schools and enterprises.

3.3.1 Policy-driven establishment of an institutionalized talent cultivation guarantee system

For the cultivation of childcare professionals based on the “dual system” model, the German government has prioritized policy formulation to establish a robust institutionalized guarantee system. Firstly, the government has clarified the boundaries of rights and responsibilities between schools and enterprises, as well as industry entry thresholds, through legislation, laying a legal foundation for collaborative talent cultivation between schools and enterprises. For instance, the

Vocational Education Act mandates that enterprises must collaborate with vocational schools to develop training plans. Secondly, a nationwide unified qualification standard for childcare practitioners has been established. The German Federal Institute for Vocational Education and Training, in collaboration with industry associations, has formulated national childcare vocational competency standards^[13]. Lastly, the government has effectively reduced the costs and risks associated with participation in the dual system for enterprises, schools, and individuals through tax deductions, financial subsidies, and other measures, enhancing their enthusiasm for collaborative talent cultivation and laying a solid economic and cooperative foundation for in-depth school-enterprise cooperation.

3.3.2 Integrating regional resources to establish a collaborative mechanism involving multiple entities

The “dual system” model fosters a cross-departmental collaborative network involving multiple entities, including the government, universities, enterprises, and industry associations, to systematically integrate regional childcare resources and establish an operational mechanism characterized by the collaboration of diverse stakeholders. Firstly, the “Inter-company Training Center”, as a crucial supplement to the German Dual System,^[14] integrates regional resources and provides a standardized practical training platform, enabling the intensive utilization of regional resources. Secondly, industry associations facilitate consensus among multiple entities through certification and assessment of talent cultivation, ensuring alignment between training objectives and industry development trends. Lastly, regional alliances led by local governments allocate resources in a targeted manner. By forming teaching and research teams in collaboration with universities, social organizations, and childcare institutions, these alliances achieve precise matching between the supply of childcare professionals and regional societal needs, as exemplified by the Bavarian Childcare Alliance.^[15]

3.3.3 Reconstructing diverse role definitions to optimize a long-term mechanism for collaborative talent cultivation

The reconstruction of roles among the government, enterprises, and universities has led to a continuous clarification of functions, rights and responsibilities among the entities, while also facilitating boundary permeability and the formation of a long-term mechanism for collaborative talent cultivation. In this context, the government serves as an institutional guarantor and resource coordinator, establishing a framework for collaborative talent cultivation through legislation, clarifying the rights and responsibilities of enterprises, schools, and industry associations, and guiding the flow of resources. Universities, acting as knowledge integrators, coordinate the alignment between enterprise needs and the translation of research outcomes, transitioning from mere knowledge transmitters to pivotal hubs for integrating enterprise demands and scientific advancements. Enterprises have been upgraded to become core designers of the talent cultivation system, deeply participating in the entire process of talent development, shifting from passive recipients of talent to proactive shapers of talent, as exemplified by the joint development of “dual-qualified instructor” courses between childcare chain enterprises and the Berlin Vocational Education Group.

4. Enlightenment on the cultivation of childcare talents from the perspective of industry-education integration

The essence of cultivating childcare professionals from the perspective of industry-education integration lies in the symbiotic evolution of the education chain and the industrial chain. Drawing

on the successful experiences of countries such as the United States, Japan, and Germany, we aim to effectively enhance the precision and effectiveness of the supply of childcare professionals.

4.1 Government-led: establishing a systematic framework for collaborative governance

In the talent cultivation system for childcare professionals, the government, as the top-level designer and guardian of public interests, plays a strategic role. The practices of the United States, Japan, and Germany collectively demonstrate the institutional support provided by legislation-led approaches, regional resource allocation through collaboration, and quality control through standardization, all of which contribute to the systematic support for cultivating childcare professionals. Firstly, the government should adopt a legal mindset to construct a comprehensive institutional framework for childcare professional training. The primary task is to expedite legislation on childcare services, clarifying the responsibilities and boundaries of departments such as education, health, and human resources through legal means, and establishing an inter-departmental joint conference system. Secondly, as a resource integrator, the government should foster a collaborative education network involving “government-enterprise-school-community” stakeholders to stimulate the vitality of diverse entities. It should guide enterprises to participate in talent cultivation, support the construction of practical training bases and industry-education integration platforms. Lastly, the government needs to establish a quality control system that covers the entire chain of talent cultivation, improve the quality supervision system, and construct standardized management mechanisms.

4.2 Universities empowering and deepening the childcare talent cultivation system

As the core entities for talent cultivation and scientific research innovation, universities play a decisive role in determining the quality of childcare professionals supplied. Universities need to systematically integrate the experiences from the United States, Japan, and Germany, such as the whole-process talent cultivation model and deep integration of industry-university-research, into localized practices. Firstly, universities should establish a “medicine-care-education” integrated talent cultivation system oriented towards job competency. This involves clarifying training objectives, restructuring the curriculum ecosystem, and constructing a progressive pathway of “on-campus simulated training - institutional internships and research studies”. Secondly, universities should focus on practical needs and establish an innovation-driven mechanism for industry-university-research integration. By taking industry pain points as research focal points and relying on industry-education integration platforms, universities can promote the transformation of scientific research achievements into teachable resources and industry standards that can be widely applied. Thirdly, universities need to leverage their technical and skill-based radiating functions to form a multi-dimensional social service network involving “universities-enterprises-communities”.

4.3 Enterprises laying the foundation: bridging the two-way educational pathway between industry and education

As the suppliers of skill-application settings, enterprises play a pivotal role in ensuring the organic integration of the education chain and the industrial chain. Drawing on the experiences of multi-stakeholder collaboration and deep school-enterprise synergy from the United States, Japan, and Germany, Chinese enterprises should apply these insights throughout the entire process of cultivating childcare professionals. Firstly, enterprises should establish a comprehensive, three-in-one capability enhancement system covering “training-certification-supervision”, stimulating endogenous motivation for professional growth and fostering a virtuous ecosystem that promotes

both the vitality and occupational identity of childcare practitioners. Secondly, enterprises should translate market demands into educational standards, providing reverse empowerment for university reforms and facilitating in-depth alignment between industrial needs and educational criteria. This involves collaborating with administrative departments and industry associations to formulate institutional frameworks such as entry standards for childcare practitioners and construction norms for practical training bases, while intervening early in the talent cultivation process. Thirdly, leveraging their advantages in training equipment and practical scenarios, enterprises should integrate job skill requirements into the talent cultivation process, construct a support system for industry-education integration, and supply high-caliber service personnel to childcare institutions.

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