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Research on Pathways for Promoting High-Quality Employment Development through the Synergistic Advancement of AI Education and Talent Development

Shengwen Yan
Institute of Management, Beijing Academy of Social Sciences

***Abstract*—** During the 14th Five-Year Plan period, Beijing achieved phased results in its AI innovation ecosystem, talent scale, policy implementation, and international appeal. However, prominent challenges remain, including insufficient supply of high-end talent, shallow synergy between education and science/technology talent development, barriers to international talent services, and inadequate policy coordination. To advance high-quality employment development during the 15th Five-Year Plan period, Beijing is advised to adopt an overarching approach centered on "strategic guidance, integrated cultivation and attraction, collaborative integration, and global openness." Specific policy measures should be implemented across four key areas: building strategic talent reserves, deepening integrated education-technology talent reforms, optimizing international talent service systems, and strengthening policy coordination and regional linkage. This will propel Beijing toward becoming a globally competitive AI talent hub, providing robust support for cultivating new productive forces and achieving high-quality development.

***Keywords*—** AI talent; Education-science-technology talent synergy; Industry-education integration; international talent services; Policy recommendations.

I. INTRODUCTION

General Secretary Xi Jinping emphasized that "developing new productive forces is an intrinsic requirement and key focus for promoting high-quality development," and called for "cultivating a large number of high-end AI talents with innovative capabilities and collaborative spirit." As a global benchmark city for the digital economy, an international science and technology innovation hub, and the "Three Cities and One District" innovation cluster, Beijing has established a comprehensive AI ecosystem spanning "basic research-technological breakthroughs-industrial applications" during the 14th Five-Year Plan period. By 2024, the core AI industry scale exceeded 300 billion yuan, attracting 35% of China's core AI enterprises and 45% of national-level AI laboratories, with a total industrial talent pool reaching 420,000 (21% of the national total). . Currently at the critical juncture between concluding the 14th Five-Year Plan and formulating the 15th Five-Year Plan, Beijing's AI education and talent development have achieved remarkable results. However, compared to the strategic goals of building a globally significant talent hub and innovation highland, structural challenges persist, including insufficient supply of high-end talent, limited synergy between education and technology talent development, and barriers to international talent services. This proposal, grounded in Beijing's "Four Centers" functional positioning and aligned with the formulation of the 15th Five-Year Plan for talent development, integrates core perspectives from talent experts on "forging strategic talent capabilities" and "establishing an integrated cycle of education and technology talent." Drawing on international and domestic talent dynamics alongside Beijing's practical experience, it presents systematic policy measures to support the creation of a globally competitive AI talent hub and promote high-quality employment development.

II. CURRENT STATUS AND KEY CHALLENGES IN BEIJING'S AI EDUCATION AND TALENT DEVELOPMENT DURING THE FINAL PHASE OF THE 14TH FIVE-YEAR PLAN

A. Phased Achievements During the 14th Five-Year Plan Period

First, sustained leadership in innovation ecosystems. Platforms like Zhongguancun Science City and Future Science City have nurtured global leaders such as Baidu and ByteDance, established 12 national-level innovation platforms including the Beijing Academy of Artificial Intelligence and the Embodied Intelligence Data Training Base, and seen five universities rank among the world's top ten AI academic institutions. Annual AI patent applications grew by 28%, accounting for 32% of the national total. Second, talent scale has steadily expanded. The total industrial workforce grew from 280,000 in 2021 to 420,000 in 2024, with 45% holding

master's degrees or higher. Annual graduates from AI-related university programs increased from 8,000 to 15,000, with programs like Tsinghua University's "Yao Class" and Beihang University's "AI+" interdisciplinary major becoming national benchmarks for cultivating top-tier talent. Third, policy implementation has deepened. Beijing issued the Implementation Plan for Accelerating the Development of a Globally Influential AI Innovation Hub, piloted a "Digital Talent Policy Special Zone" in Yizhuang, and introduced combined subsidies of "computing power vouchers + data vouchers." The Beijing-Tianjin-Hebei region launched a joint vocational education talent cultivation program for robotics, establishing eight industry-education integration bases including the "Haidian-Yizhuang" Digital Talent Training Corridor. Fourth, international appeal has gradually increased. Eight international talent communities have been established, the "Zhongguancun-Silicon Valley Technology Passport" launched, and a digital talent certification alliance co-founded with Berlin and Singapore. In 2024, over 1,200 high-level overseas AI talents were recruited, marking a 65% increase compared to 2021.

B. Prominent Contradictions in Relation to the 15th Five-Year Plan Strategic Goals

The supply of high-end talent does not match China's status as a major power, resulting in weak strategic talent capabilities. Research indicates that China faces a shortage of strategic scientists and high-end talent, falling short of the goal to build a globally significant talent hub. Beijing has fewer than 60 strategic scientists in artificial intelligence—just one-seventh of Silicon Valley's count. Only 232 top-tier researchers (listed on the Global AI 2000 ranking) exist, less than one-fifth of the U.S. total. Basic research personnel constitute merely 8.3% of the talent pool, far below Stanford University (35%) and MIT (32%). The patent conversion rate for AI research in universities stands at just 7.1%, indicating persistent bottlenecks in the "last mile" of technology transfer. This falls short of the "15th Five-Year Plan" requirement to achieve breakthroughs in "0-1 original innovation."

Insufficient synergy between education and technology talent development, with inadequate depth in industry-education integration. First, university training is disconnected from industrial needs. Among the city's 32 universities offering AI programs, only 9 provide cutting-edge courses like AIGC and multimodal large models. While 85% of universities have signed cooperation agreements with enterprises, fewer than 35% have achieved "joint curriculum development and faculty exchange" (Sun Rui pointed out that "insufficient industry-education integration leads to talent supply-demand mismatch"). Among Beijing's 2024 AI graduates, 41% required "secondary training" from enterprises due to lacking engineering practice skills. Second, vocational education and lifelong learning systems lag behind. While Shenzhen trains 100,000 "digital craftsmen" annually, Beijing's AI vocational training reaches only 45,000 participants per year, with 60% concentrated in low-skill areas like data annotation. Internal corporate training academies cover just 15% of enterprises—far below Shanghai's 35% and Shenzhen's 42%. Third, the "three-in-one" coordination mechanism is absent. Policy alignment among education, science and technology, and talent departments remains inadequate. For instance, computing resources in university AI labs are not integrated with corporate R&D needs, and government-funded research projects are disconnected from talent development objectives. This failure prevents the formation of a closed-loop "innovation chain-industrial chain-talent chain" (referencing Hunan's "Education-Science-Talent Integrated Reform Model").

The international talent service system remains underdeveloped, with insufficient global resource allocation capabilities. Following the national introduction of the K-visa for foreign young science and technology professionals, Beijing has rolled out supporting services. However, three barriers persist: First, the permanent residency application process is cumbersome, with foreign AI experts taking an average of 18 months to obtain permanent residency—2.5 times longer than in Silicon Valley. Second, cross-border data flows face restrictions, with only 32% of AI training data export applications approved, hindering international joint R&D. Third, living services are inadequate, with a shortage of 12,000 international school seats and multilingual medical service coverage at just 40%, failing to meet overseas talent's expectations for "attracting both local and distant talent" (refer to Weihai International Talent Port's "Nine Centers and Five Platforms" service model).

Policy coordination is insufficient, with disparities between regions and enterprises becoming prominent. First, municipal and district policies operate in isolation. The Haidian District "Golden Seed" program and Chaoyang District "Phoenix Plan" exhibit 15 discrepancies in talent recognition criteria, forcing enterprises to resubmit materials when applying across

districts—increasing administrative costs by 40%. Second, support for SMEs remains inadequate. SMEs, comprising 78% of the city's AI enterprises, receive computing power voucher subsidies at only 12%, far below the 65% rate for larger enterprises. Third, insufficient depth in Beijing-Tianjin-Hebei coordination. Despite introducing the "Beijing-Xiongan-Langfang Digital Talent Commuter Pass," mutual recognition of professional titles across the three regions covers only 30% of AI positions, and cross-regional training base sharing rates remain below 25% (compared to the Yangtze River Delta's "universal redemption mechanism for science and technology innovation vouchers").

III. OVERALL APPROACH AND POLICY RECOMMENDATIONS FOR ACCELERATING THE COORDINATED DEVELOPMENT OF ARTIFICIAL INTELLIGENCE EDUCATION AND TALENT IN BEIJING DURING THE 15TH FIVE-YEAR PLAN PERIOD

Guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, we must thoroughly implement General Secretary Xi Jinping's important directives on the "trinity of education, science and technology, and talent." Anchored in the strategic goal of "accelerating the development of Beijing as a globally significant talent hub and innovation center," and grounded in Beijing's positioning as a "global benchmark city for the digital economy," we must focus on addressing the core challenges of "shortages of high-end, specialized talent, insufficient integration between industry and education, and weak international talent allocation capabilities." Driven by institutional and systemic innovation, to build an AI talent development system characterized by "strategic guidance, simultaneous cultivation and attraction, collaborative integration, and global openness." This will achieve dual improvements in talent scale and quality, ensure full alignment of the education and training system, significantly enhance international competitiveness, and establish comprehensive collaborative mechanisms—all to provide robust support for cultivating new productive forces.

A. Building Strategic Talent Capacity to Address Shortages in High-End Talent Supply

Implement the "Strategic Scientist Leadership Program." Leveraging national major scientific infrastructure (e.g., Huairou Science City), establish 50 "Chief Scientist Studios," each receiving an average annual R&D budget of 20 million yuan to support strategic scientists in spearheading frontier research in foundational algorithms, quantum AI, and other cutting-edge fields. Establish a tiered cultivation mechanism linking "strategic scientists – young leading talents – core teams." Each studio will be staffed with 3-5 young talents under 35 years old, each receiving up to 500,000 yuan in start-up funding (referencing Shandong Province's "Young Science and Technology Talent Support Platform" model).

Deepen the "Outstanding Engineer" university-enterprise joint training program. Drawing on Huazhong University of Science and Technology's model of "Council + Expert Committee + Three-Tier Practical Chain," implement the "3+2+1" training model (3 years of general education + 2 years of corporate training + 1 year of project incubation) at 15 universities including Tsinghua University and Beihang University. Universities are required to establish "corporate-named research institutes" in collaboration with leading enterprises like Baidu and Huawei. Each enterprise must invest no less than 15 million yuan annually in R&D funding. Universities will dispatch full-time faculty teams to participate in research, while students earn credits through project-based practice. Revenue from technology commercialization will be distributed at a ratio of "70% to enterprises + 30% to universities." By 2030, 50 corporate research institutes will be established, annually cultivating over 5,000 outstanding engineers.

Establish a dedicated "AI Young Talent" support mechanism. Addressing the shortage of young scientific talent, a 1 billion yuan "AI Young Talent Fund" will be created. Young professionals under 35 who have led provincial-level or higher AI projects will receive up to 1 million yuan in startup subsidies. Implement a "pre-tenure-track to tenure-track" system, piloting "Young Researcher" positions in AI disciplines at municipal universities. Appointments will carry associate professor status upon entry, with successful three-year evaluations leading directly to tenure-track professor appointments. Establish a "Young Talent-Mentor" pairing mechanism, with mentors from academicians and corporate chief technology officers providing regular technical guidance and career planning.

B. Deepen the Integrated Reform of Education, Science, Technology, and Talent Development to Build a New Ecosystem for Industry-Education Integration

Promote dynamic alignment between university disciplines and industrial needs. Implement the "AI+X"

interdisciplinary initiative, supporting Peking University in establishing "AI+Healthcare" and Beijing University of Posts and Telecommunications in launching "AI+Communications" among 10 cross-disciplinary programs. The Municipal Education Commission will allocate RMB 8 million annually to each program for development. Establish a dynamic curriculum adjustment mechanism. Led by the Municipal Education Commission, convene biannual "Curriculum Optimization Workshops" with universities, enterprises, and industry associations to incorporate cutting-edge technologies like large-model training and digital twins into teaching content (referencing Tianjin University's "130 Micro-Major Interdisciplinary Training System"). By 2026, achieve comprehensive coverage of frontier courses in university AI programs.

Build a collaborative platform integrating government, industry, academia, research, and application. Upgrade the "Haidian-Yizhuang" Digital Talent Training Corridor by integrating scientific resources from Zhongguancun Science City with industrial resources from Yizhuang Economic Development Zone. Establish 10 national-level industry-education integration practice bases, each equipped with no fewer than 800 training workstations, accommodating over 30,000 student training sessions annually. Drawing inspiration from Beijing's "Lingjing Valley New Talent Shared Courtyard" model, establish "AI Talent Shared Spaces" across all 16 administrative districts. These spaces will integrate office, meeting, and training functions to provide one-stop services for universities, enterprises, and small-to-medium teams. Tenant teams will receive venue subsidies of up to 500,000 yuan.

Enhance the vocational skills training and lifelong learning system. Implement the "One Million Digital Craftsmen" training program, collaborating with companies like SenseTime and Megvii to develop 150 specialized AI vocational competency standards (covering emerging professions such as large model trainers and AI ethics reviewers). Train 120,000 individuals annually, including at least 36,000 advanced-level skilled personnel. Establish a "credit bank" system where online learning achievements (e.g., Tsinghua University's XuetangX courses) can be converted into vocational skill credits. Upon accumulating qualifying credits, individuals may apply for corresponding vocational qualification certificates (referencing Guangxi's "Digital Talent Advancement Plan"). Certified individuals will receive up to ¥2,000 in rewards, while training enterprises will be subsidized at ¥6,000 per trainee.

C. Optimizing the International Talent Service System to Enhance Global Resource Allocation Capabilities

Aligning with the national K-visa program, launch the "Beijing International Talent Convenience Package." For young foreign science and technology talents, streamline the K-visa application process to enable "online submission with preliminary review within 3 business days." Establish "International AI Talent Green Channels" at Capital Airport and Daxing Airport, staffed with multilingual service specialists. Launch the "3+X" service package: 3 core services (permanent residency application guidance, work permit processing, housing rental) + X customized services (school enrollment coordination, medical appointments, tax consultation). AI experts selected for the "Overseas High-Level Talent Program" will receive up to 500,000 RMB in relocation subsidies (referencing Dalian's "high-level talent housing fund loan increase" policy).

Establish dual platforms: "International Talent Communities + Innovation Hubs." Create seven new international talent communities in Zhongguancun Science City and Future Science City, complete with international schools, multilingual hospitals, and foreign talent service centers to achieve comprehensive coverage of "15-minute quality living zones." Establish "AI Joint Laboratories" with Silicon Valley, Berlin, and other global hubs to promote cross-border mutual recognition of qualifications for six scarce positions, including large model trainers and quantum algorithm engineers. Annually host the "Global AI Elite Beijing Tour," inviting overseas talents from over 18 countries to connect with local enterprises, facilitating at least 50 international cooperation projects (referencing Beijing's "Global AI Innovation Hub" development initiatives).

Break down barriers to cross-border data flow. Pilot an "AI Training Data Cross-Border Whitelist" in Yizhuang's "Digital Talent Policy Special Zone," implementing a "record-filing system" for non-sensitive data (e.g., public transportation footage, industrial equipment parameters) to exit the country, reducing approval time to 7 working days. Establish a "Data Security Assessment Sandbox" to collaborate with companies like Baidu and JD.com in developing data anonymization standards, balancing data security with international cooperation needs. AI enterprises utilizing overseas data for R&D will receive up to 3 million yuan in "data procurement subsidies."

D. Strengthen Policy Coordination and Regional Synergy to Optimize the Talent Development Ecosystem

Improve the "Municipal-District Coordination + Central-Local Synergy" Mechanism. Issue the Beijing Digital Economy Talent Development Five-Year Plan (2026-2030), establish a "Digital Economy Talent Task Force" led by municipal leaders, and convene monthly coordination meetings to resolve cross-departmental and cross-regional issues. Establish a "Policy Coordination List" to unify AI talent recognition standards and subsidy policies across all 16 administrative districts, achieving "one-time recognition, citywide applicability." Integrate the Human Resources Bureau's professional title system with the Economic and Information Bureau's industrial talent database to promote mutual recognition of 28 indicators including technical patents and project achievements (referencing Lianyungang's "card-code integration" model).

Enhance support for small and medium-sized enterprises. Upgrade the "Beijing AI Talent Shortage Index Dashboard," expanding monitored enterprises from 300 to 500 (covering 80% of small and medium-sized AI enterprises), and publish monthly lists of in-demand positions with salary guidelines. Expand the coverage of "computing power vouchers + data vouchers," providing SMEs with subsidies equivalent to 5% of their annual revenue, capped at 5 million yuan (computing power vouchers can be used to lease resources from the Beijing Supercomputing Center, while data vouchers can be used to purchase public data services). Establish a "leading enterprises + SMEs" pairing mechanism, organizing 20 leading companies like Baidu and ByteDance to collaborate with 200 SMEs. Through "technology sharing + talent training," cultivate 3,000 practical professionals annually, with leading enterprises receiving a subsidy of 8,000 yuan per person.

Deepen AI talent collaboration across Beijing-Tianjin-Hebei. Advance the "Beijing-Tianjin-Hebei Digital Talent Community" initiative, expand the scope of the "Beijing-Xiongan-Langfang Digital Talent Commuter Pass" to achieve cross-regional social security integration and unified public services. Jointly establish the "Beijing-Tianjin-Hebei AI Talent Cloud Market," aggregating demand from 300,000 enterprises to build a 20-million-level talent database and facilitate cross-regional talent mobility. Establish five "Beijing-Tianjin-Hebei AI Training Bases" in Xiongan New Area and Langfang. Beijing universities will collaborate with Hebei and Tianjin enterprises to conduct practical training, with students receiving mutually recognized skill certificates upon completion (referencing the Beijing-Tianjin-Hebei "Robotics Vocational Education Talent Co-development Plan").

Strengthen Resource Coordination and Ecosystem Monitoring. Establish a 30 billion yuan digital talent fund using a "government-guided + market-operated" model, prioritizing support for high-end AI talent projects and industry-education integration bases. Implement a "government co-investment" mechanism where the fund invests 30% of the financing amount for enterprises founded by top talent, with a maximum co-investment of 50 million yuan. Implement a "Digital Talent Ecosystem Index" monitoring system with 12 secondary indicators including talent density, achievement conversion rate, and policy satisfaction. Publish assessment reports biannually, incorporating results into government department performance evaluations. Benchmarking against international leaders like Silicon Valley, strive to achieve Beijing's digital talent density at Silicon Valley levels by 2030, with annual growth in technology contract transactions exceeding 20%.

IV. CONCLUSION

Promoting the coordinated development of artificial intelligence education and talent in Beijing is a key measure to serve national strategies, cultivate new productive forces, and advance high-quality employment growth. During the 15th Five-Year Plan period, strategic foresight must guide planning and deployment, while reform and innovation resolve challenges. This will drive deep integration between the education chain, talent chain, industrial chain, and innovation chain, enabling more high-caliber AI talent to emerge. Such efforts will provide robust support for building Beijing into a globally significant talent hub and innovation center, and for propelling high-quality employment development.

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