

# For Every Future: China Spotlight

## Preparing China's Early-Career Skilled Trade, Technical and Service Talent for an AI-Infused World

Building on our global [For Every Future](#) report, this spotlight report applies the same analysis to the Chinese context, using locally relevant evidence to understand how AI is reshaping career pathways in skilled trades, technical and service work in China.

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# A China lens on the global story

## China's next phase of economic growth depends on skilled trades, technical and service workers.

Manufacturing, infrastructure, healthcare, logistics and services underpin China's ambitions for industrial upgrading, technological innovation, and productivity growth. Demand for skilled workers is expected to continue rising over the coming decade. Yet these roles sit at the center of a transformation. Artificial intelligence (AI) is becoming increasingly embedded in everyday work, changing how problems are solved, how expertise develops, and how workers learn on the job.

For years, much of the debate about AI has focused on knowledge work. Far less attention has been paid to the skilled trades, technical and service roles that keep economies functioning. Our research suggests that this is a significant oversight. AI is already beginning to reshape these occupations, not by replacing workers, but by augmenting how work is performed, how decisions are made, and how capability is developed. As Zhisheng Gao, General Manager at Zhengzhou Jiean Hi-tech Co., Ltd notes,

**"If AI policy and investment focus predominantly on white-collar knowledge work, we risk creating an unbalanced digital transformation. What would be missed is not merely a skills gap, but a widening social and economic divide that could leave the skilled trades workforce underprepared for the evolving workplace."**

China brings these trends into particularly sharp focus. As demand for skilled workers rises, the country's working-age population is expected to decline. Pearson's analysis suggests this could create a structural workforce gap of around 149 million skilled trades, technical and service workers by 2035.

These forces create both urgency and opportunity: urgency to ensure that enough skilled workers are available to support future growth, and opportunity to rethink how early career entrants learn, work and develop expertise in an increasingly AI-enabled economy.

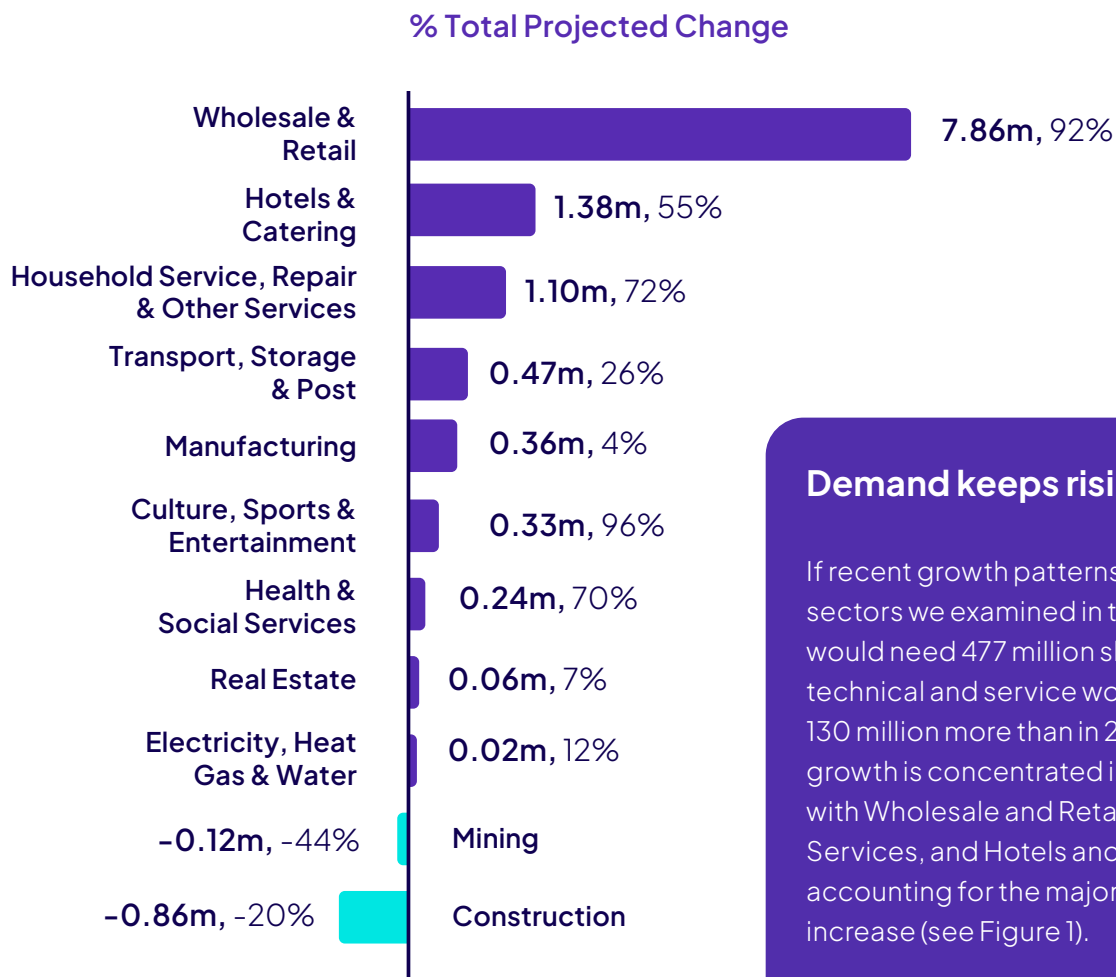
Many economies are experiencing the same combination of technological change, rising demand for essential workers, and mounting pressure on education and training systems to keep pace. But in China, these forces are colliding at exceptional scale and speed. That makes China a valuable case study for understanding how AI is reshaping skilled work, and how employers, educators and policymakers can build stronger early-career pathways for an AI-enabled future.



# China's readiness challenge: demand, supply and the productivity imperative

China's workforce challenge brings the global story into sharp focus. Three forces are converging: sustained demand for skilled, technical and service workers, a demographic turning point, and a productivity imperative that raises the value of AI augmentation.

Figure 1: Average annual hiring in China by cluster, 2023–2035



## Demand keeps rising

If recent growth patterns continue, the sectors we examined in this research would need 477 million skilled trade, technical and service workers by 2035, 130 million more than in 2023. Sector growth is concentrated in services, with Wholesale and Retail, Household Services, and Hotels and Catering accounting for the majority of the increase (see Figure 1).

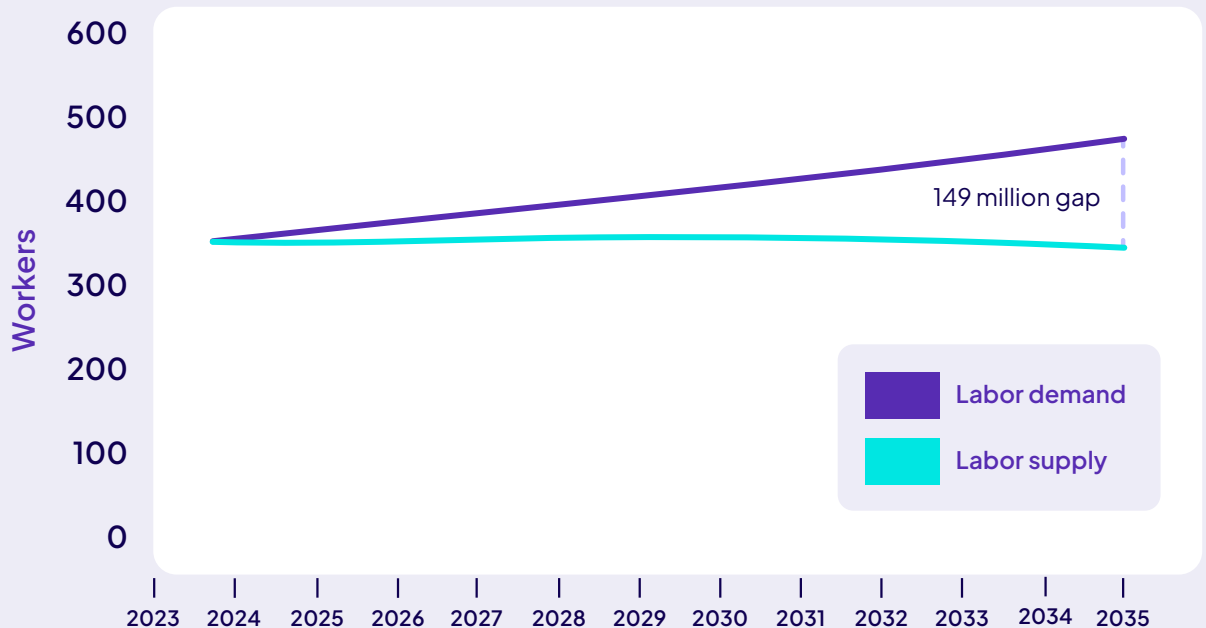


## Supply has already peaked

China's working-age population is expected to peak in 2026–27 and then decline. Unless a greater share of people join the workforce or become trained in these fields, the skilled trade, technical and service workforce falls to 320–328 million by 2035, moving in the opposite direction to demand.

The result is a projected structural gap of around 149 million workers by 2035 (see Figure 2). This is not a forecast of unfilled vacancies; it is a signal that supply alone cannot meet demand. Even under the most optimistic combination of workforce measures, higher participation, faster reallocation from agriculture, and more graduates entering skilled trade roles, the gap only closes by around half. The remainder must come from making each worker more productive. AI augmentation and automation are the levers that can enable that.

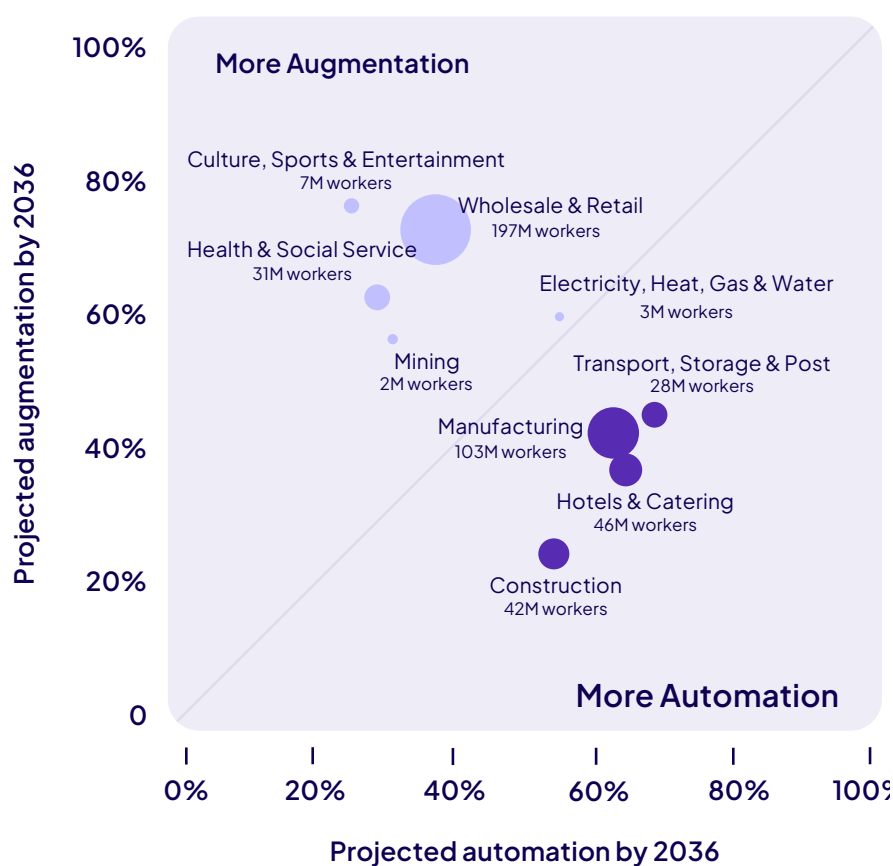
**Figure 2: Skilled trade, technical and service demand versus supply in China 2023–2035 (millions)**



## Using AI to expand workforce capacity

AI is unlikely to reshape every part of China's workforce in the same way. Our sector-level analysis using Pearson's Faethm workforce analytics database shows substantial variation across industries (see Figure 3). Manufacturing, Transport, Hotels and Catering, and Construction lean more toward automation, while Wholesale and Retail, Health and Social Services, Household Services and Culture, Sports and Entertainment,

show greater potential for augmentation. Electricity, heat, gas and water stand out as the only sector about equal on both measures, suggesting that AI could both take on tasks and support workers in that industry. Wholesale and retail, the largest sector in the workforce projection at 197 million by 2035, is particularly important because of its scale and relatively strong augmentation potential.



**Figure 3: How AI may affect work across sectors in China**

Sectors positioned close together have similar combinations of automation and augmentation potential.

The diagonal line indicates where automation and augmentation potential are equal. Bubble size represents projected skilled trade, technical and service occupations employment in 2035.

### The future of AI-enabled skilled work in China

As Jiajia Yi, Chairman of Sunso Intelligence observes, "Artificial intelligence will gradually reshape the way work is carried out by updating or redefining job roles, thereby reshaping the competencies required for skilled trade, technical and service occupations." Chinese researchers have even created a term to reflect the growing AI augmentation of roles requiring a combination of hands-on skilled work with digital fluency—"purple collar." Renmin University forecasts that demand for such workers will see significant growth in the coming decade, a signal that the future of skilled work in China will be defined by the combination of AI and human labor, not one or the other.

# Implications for training and education pathways

Against this backdrop, Pearson's *For Every Future* report identifies four challenges that will shape early-career pathways in an AI-infused world:

## Accountability and risk

As AI moves into everyday practice, questions of ownership, escalation and responsibility for outcomes are unresolved across geographies. In Chinese workplaces, this question is especially sharp for early-career workers, who may be asked to work alongside AI systems before they have deep operational experience.

## Education, training and capability-building

Across every geography in our research, qualifications, apprenticeship standards and curricula move more slowly than the technology being adopted in the workplace. In China, this challenge is compounded by the pace of AI adoption in industry and the diversity of sectors, roles and provider types, from state-owned enterprises to private vocational providers to industry-education partnerships. Many instructors and workplace mentors are themselves still developing familiarity with AI tools.

## Expertise and tacit knowledge

As experienced workers retire and AI takes on more routine tasks, there is a real risk of losing the tacit, hard-won knowledge underpinning skilled trades and technical work. Newcomers can quickly reach baseline competence with AI assistance yet may lack the deeper understanding of why things are done in a particular way - the situational judgment built through practice, not through access to information alone. This balance may be particularly difficult for China to strike, and the moment to strike it is narrowing. Even with recent policy change raising the retirement age, the coming waves of retirement sharpen the country's challenge of capturing and preserving expertise while still providing newer workers with the hands-on experience they need to develop their own expertise.

## The human factor

Communication, judgment under uncertainty, ethical reasoning and the ability to build trust with customers and colleagues become more, not less, important as AI takes on more routine cognitive and operational work. Chinese partners describe these as capabilities that AI cannot replicate and that must be intentionally developed.

# China's emerging solution

China does not approach these challenges from a standing start. The country has one of the world's largest and most established vocational education systems, a strong tradition of training embedded in industry, and a growing willingness to experiment with advanced technologies. China is at the leading edge of both the workforce challenge and the response.

## Curricula and qualifications that mirror labor-market needs

China's vocational education system is already characterized by close ties between providers and industry. However, the industry experts we spoke to argued for even tighter alignment between:

- ➞ Curricula taught in vocational programs.
- ➞ Assessments and qualifications used to screen candidates for entry into the field.
- ➞ What early-career workers actually need: both AI-ready skills and more durable 'human' skills.

One approach to driving this alignment is to move beyond static qualification systems and create more responsive ways of recognizing capability as it develops. As AI reshapes occupations and competency requirements, education and training providers may need mechanisms that capture learning, workplace performance and practical achievement throughout a learner's career. Tencent Research Institute argues that

more flexible credentialing approaches could complement traditional qualifications, helping employers better understand how individuals' capabilities align with evolving workforce needs.

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**More granular supporting mechanisms are required: convert learning records, practical training results and project deliverables into traceable, mutually recognized micro-credentials... Competency profiles can then be intelligently matched against corporate job demands to ensure skill certification aligns with evolving market requirements"**

Pengyang Wu,  
Senior Research Specialist,  
Tencent Research Institute

Another curriculum upgrade needed is a greater focus on developing durable human skills, which employers often favor over specific technical skill.

Sunso Intelligence points out that in China, a significant share of young people leaves the workforce in their first two years, not because they lack capability, but because they struggle to adapt. Thus, while early career candidates should be developing discipline knowledge and job-specific AI skills, they must not neglect durable human skills, such as communication, learning to learn, and holding a growth mindset.

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**In the right scenario, AI can significantly improve productivity and efficiency, but it cannot replace the process of building trust with customers or the communication and coordination required in engineering and operational settings...The transition from school to work, and from the classroom to the factory job or office environment, is essentially a process of relearning. It involves not only acquiring new knowledge but also adapting to different ways of learning and working. These are uniquely human experiences that artificial intelligence cannot replicate"**

**Jiajia Yi, Chairman, Sunso Intelligence**

The broader implication is a required system shift: vocational and qualifications providers developing and recognizing durable human skills in curricula, vocational qualifications, and assessment.

## Experience-first pedagogy

Chinese partners describe employing a pedagogical approach that increasingly enriches lecture-based instruction with a range of experiential learning activities, including inquiry- and project-based learning, high-fidelity simulations and virtual environments, integrated work-study, and internships.

**One particularly intriguing approach, called AI-collaboration training, centers on "AI trust calibration": training that helps early-career workers develop the judgment to know when to accept an AI recommendation, when to supplement it with field verification, and when to override it.** Jiean Hi-tech, which works on rail transit systems, builds this into training from the outset by presenting workers with scenarios where AI confidence and human intuition diverge, so calibration is developed through repeated practice rather than transmitted through rulebooks.



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**Workers who have not received systematic AI-collaboration training tend to respond to AI-generated fault diagnostics in two contrasting ways: either placing excessive reliance on AI conclusions while overlooking on-site details, or disregarding AI support entirely due to lack of trust. Both approaches affect efficiency and safety."**

**Zhisheng Gao, General Manager at Zhengzhou Jiean Hi-tech Co., Ltd**



This approach can foster conversations about AI accountability and risk, while providing early-career workers the opportunity to develop tacit knowledge in zero-risk environments. Jiean Hi-tech notes this approach also has an equity dimension: simulation-based training transcends the limits of physical equipment and geography, enabling learners in remote regions to practice on the same virtual systems as those in major industrial centers.

Several local initiatives across China are moving in this direction. For instance, skills training programs led by local trade unions in Jiaxing (Zhejiang) and Jinzhou (Liaoning) introduce genuine corporate equipment and live production scenarios directly into training classrooms.

Trainees can engage with a “production-grade AI” prone to errors that require human verification, instead of error-free demonstration versions used for teaching. This approach effectively builds practical capabilities for AI deployment.

As Pengyang Wu, Senior Research Specialist at Tencent Research Institute points out, “Training for such occupations should prioritize extended hands-on practice in real, unpredictable environments, rather than devoting extensive training hours to controllable, repeatable simulator exercises. Tasks that can be readily simulated and standardized are precisely those AI is more likely to master going forward.”

## Vertical AI systems with expert feedback loops

Another attribute of China's emerging approach relies on purpose-built AI systems that are pretrained on domain-specific ontologies, use cases, and workflows rather than expecting workers to rely on general-purpose LLMs, which may be good at comprehending language and retrieving information, but lack the specialized context needed for practical use.

A further insight is that frontline workers themselves are a valuable source of expertise for the AI systems they work with. Experts' tacit knowledge can be captured through structured feedback loops from experienced workers back into vertical AI models. These models then support real-time practice and feedback for early career workers, who, as they learn and develop, restart the cycle.

Zhisheng Gao explains it this way:

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Within Jean Hi-tech's training framework, 'human-machine collaborative learning' is treated as a core mechanism: workers gain knowledge support from AI, while simultaneously contributing structured feedback—corrections, validations, and edge-case observations—that helps the model improve. This creates a mutually reinforcing cycle in which both the worker and the AI system advance together...Through the collaborative learning loop, workers evolve from task executors into AI collaboration managers—not only using AI but also participating in its ongoing refinement, gaining new dimensions of professional growth.”

# A moment of opportunity for China

The forces at work in China's skilled, technical and service workforce – sustained demand, demographic pressure, industrial upgrading and rapid AI adoption – are converging faster than in most other economies. This combination makes the questions posed by the *For Every Future* report especially urgent, and China's response consequential well beyond its borders.

**The evidence points to a shared conclusion. AI will not remove the need for skilled, technical and service workers; it will raise the value of the work they do. For early-career entrants, that means new tools, new responsibilities, and new pathways for growth.**

For employers, educators and regulators, it means moving faster (while remaining in sync) to build the training, the safeguards and the human capabilities that AI-infused work now demands.

**China has a rare opportunity to set the standard for preparing young people for careers in AI-enabled skilled, technical and service industries.**

Its tradition of industry-education integration, its adoption of experience-first pedagogies, and its investment in purpose-built AI systems designed to capture and refine tacit knowledge and expertise provide an excellent foundation for preparing an early-career workforce. The challenge will be for China to maintain this momentum so that its workforce can do more than use AI – they can grow alongside it.





# Building expertise in an AI-infused world

AI is changing skilled work. The imperative now is building expertise through stronger connections between learning, assessment, credentials and real-world experience.

**Closing the gap is essential to workforce readiness.**

Learn more: [pearson.com/ai-ready-careers](https://pearson.com/ai-ready-careers)