



EXECUTIVE SUMMARY

For Every Future:

**Preparing Early-Career Skilled Trade,
Technical and Service Talent for an
AI-Infused World**

AI is changing skilled work.
The imperative now is building expertise.

SEPTEMBER 2026

AI is Quietly Changing Early Career Roles in Skilled Trades, Technical and Service Industries.

Pathways must evolve to keep pace.

Skilled trade, technical, and service occupations are among the most important roles in modern economies. They keep critical infrastructure running, support healthcare systems, maintain industrial production, and provide many of the everyday services on which societies depend. Our modelling demonstrates that across the United States, United Kingdom and China, demand for these workers is expected to intensify over the coming decade. In some sectors, growing demand is amplified by labor shortages, demographic pressures, and the retirement of experienced workers.

At the same time, these occupations are entering a new phase of technological change. Artificial intelligence (AI) is increasingly being embedded into day-to-day work, supporting tasks such as diagnostics, troubleshooting, information retrieval, workflow management, and decision support.

Across the occupations examined in this research, the dominant story is not one of jobs disappearing. Instead, AI is becoming part of how work gets done, changing tasks, workflows, and expectations of competence.

In skilled trade, technical and service occupations, early career workers develop expertise differently from many office-based roles. Competence is built primarily through direct workplace experience rather than solely through formal education. New entrants learn by practicing, observing experienced colleagues, receiving feedback, developing judgment, and gradually building the tacit knowledge that underpins effective performance. Our research suggests that

as AI becomes more embedded in the workplace, these pathways to expertise are being reshaped.

To explore these changes, Pearson combined labor-market analysis across the United States, United Kingdom and China with Pearson Faethm modelling of predicted automation and augmentation exposure up to 2036. We examined two occupations in depth: pharmacy technicians and industrial machinery mechanics, combining our analyses with roundtable, interview and survey data from employers, educators, industry bodies, workforce experts, early career entrants and students. Together, these occupations provide contrasting examples of how AI is reshaping both technical, equipment-based work and people-centered service roles. The job of an industrial machinery mechanic relies on hands-on mechanical skills with some diagnostic and problem-solving work. Looking closely at this role helps illuminate how AI may affect technical, equipment-based work. By contrast, the pharmacy technician role is less mechanical but more focused on people and coordination. Analysis of this role shows how AI may affect healthcare support work and daily workflow coordination.

Both the experts and frontline workers we spoke to confirmed that AI is already impacting skilled trade, technical and service work. As these roles are reshaped, the key challenge is whether education, training, and workplace learning can evolve quickly enough to help workers build the expertise, judgment, and confidence needed to succeed.

The future of these occupations will depend on how effectively employers, educators, policymakers and industry leaders adapt the pathways that prepare people for them.

Key Findings Shaping the Future of Early Careers in Skilled, Technical and Service Industries.

AI is rapidly reshaping occupations not typically associated with the AI conversation.

Much of the AI conversation has focused on office-based knowledge work. But AI is also becoming part of how work gets done across skilled trade, technical and service occupations, changing tasks, workflows and expectations of competence.

The dominant pattern across both the labor market analyses and the occupational deep dives is augmentation, where AI is likely to change how work is done rather than replacing it entirely.

Pharmacy technicians described opportunities for AI to streamline dispensing, inventory management and administrative processes, potentially creating more time for patient-focused care. Industrial machinery mechanics identified opportunities to improve access to technical knowledge, support documentation, and accelerate problem solving. In both occupations, however, participants stressed that human judgment remains essential. AI may change how work is done, but it does not remove the need for workers who can interpret context, recognize risk, and make informed decisions.

As AI becomes embedded in workplace processes and decision-making, questions of accountability become increasingly important. Early career workers need to know when to trust AI, when to question it and when human judgment must take precedence, particularly in contexts where safety, quality and professional accountability remain critical.

Demand for skilled trades, technical and service workers is already high and rising at the same critical moment those jobs are being reshaped by AI. Much of that demand will be driven by people retiring or leaving skilled jobs.

The challenge is not simply filling vacancies but building expertise faster and transferring practical know-how to the next generation. In the US and UK, nearly 99% of skilled job openings result from replacing workers who retire, change occupations or leave the labor market, leading to a "brain drain" of hard-won expertise and experience. This means that even in sectors where the number of jobs doesn't grow, the need to replace workers is still urgent. In sectors like healthcare, the replacement demand is compounded by the overall growth in roles.

98.5%

of annual openings in US skilled trade, technical and service occupations are driven by replacement demand. (14.1M of 14.3M annual openings are replacement hires).

99%

of skilled job openings in the UK stem from replacing workers who retire, change careers or leave the workforce. (4M+ openings over the decade are replacement hires).

In China, the number of skilled jobs is set to increase by a staggering amount: from 347M in 2023 to 477M by 2035. But a demographic cliff is coming: as the population peaks, the supply of skilled workers for these jobs is expected to be 328M, potentially leaving nearly 150M jobs empty.

+130M

**additional skilled jobs
projected in China by 2035
(from 347M to 477M).**

nearly 150M

**potential skilled worker
shortfall in China by 2035.**

A new and distinctive triple capability gap is emerging for skilled trades, technical and service workers, reshaping how expertise is built: they need role-specific AI literacy and critical judgment, they must develop the human capabilities that set them apart from AI, and they must absorb the institutional knowledge and practical know-how that retiring experts are taking with them.

Participants across the research highlighted a growing disconnect between changing workplace practices and the capabilities of early-career entrants. The vast majority of pharmacy technicians we heard from said AI was not explicitly covered in training, despite its growing presence within workplace systems and processes. Similarly, fewer than half of early-career industrial machinery mechanics were confident their existing training would adequately prepare them for AI-augmented work.

As AI becomes more embedded in skilled work, human capabilities, such as communication, collaboration, adaptability, emotional intelligence, and learning agility, become more important. In pharmacy settings, respondents emphasized patient communication and critical evaluation of AI outputs. In industrial settings, participants highlighted interpersonal skills like collaboration and cross-disciplinary working, as well as traits like curiosity, learning from failure, and an orientation toward lifelong learning.

These gaps are emerging at a time when increasing waves of aging workers are retiring and taking their expertise and tacit knowledge with them. Much of what defines expertise in skilled trade, technical and service occupations is not learned through formal instruction but developed through experience; observation, practice, mentoring, feedback and exposure to real-world complexity. AI may help capture and distribute some forms of knowledge but experience itself remains difficult to replicate.



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Closing these gaps requires three things at once: education, training and workplace learning must evolve to build role-specific AI literacy and critical judgment, strengthen durable human capabilities, and expand opportunities to develop practical know-how through mentoring, observation, feedback, simulation and hands-on experience.

Our research highlights the importance of accumulated understanding that helps experienced workers recognize risks, solve problems, and make effective decisions. As experienced workers retire and AI becomes more prominent, new entrants need opportunities to build their own judgment through real work, not only through access to information. Effective pathways will need to combine technical capability, responsible AI use, uniquely human skills, and workplace experience that accelerates the development of expertise.

If these challenges are not addressed, we risk leaving workers behind, creating dangerous gaps in safety-critical occupations, and limiting employers' ability to find and develop the skilled workers they need.

Priorities for Action: Building Future Pathways for the Skilled Workforce

How we prepare early-career entrants for skilled trades, technical and service roles in the future requires immediate action.

Our research points to four priorities that employers, educators, policymakers and industry bodies must act on now:



Trust & responsibility

Establish clear boundaries for when AI can be trusted, questioned or overridden and who is accountable when it fails.



Education and training

Build pathways that can adapt as fast as the work itself, not just when standards, qualifications and curricula are due for review. Ensure role-specific AI literacy is prioritised alongside foundational AI skills.



Experience and tacit knowledge

Capture the expertise of retiring workers, while ensuring new entrants still build judgment through real practice and hands-on experience.



The human advantage

Treat communication, collaboration, and adaptability as core capabilities to be taught deliberately, not left to chance.

The scale of demand for these roles, set against how little preparation currently exists for AI-augmented work, means the cost of delay is likely to be severe. The risk is lost opportunity for an entire generation of workers our economies depend on.

Pearson believes this is a moment for action, not observation. As the world's lifelong learning company, we are committed to helping employers, educators and policymakers build the pathways this workforce needs, and [our report](#) sets out stakeholder-specific actions for employers, educators, policymakers and industry bodies.



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