

# Reskilling strategies for AI-driven economies: the UAE context

## Abstract

**Background:** Artificial intelligence (AI) is fundamentally transforming labor markets worldwide, creating unprecedented challenges for workforce development and national competitiveness. The United Arab Emirates (UAE), with its ambitious Vision 2031 and National AI Strategy 2031, represents a critical case study of how resource-rich economies navigate the transition from oil-dependent models to knowledge-driven, AI-enabled futures. Understanding effective reskilling strategies in this context is essential for policymakers, employers, and educational institutions across the Gulf Cooperation Council (GCC) region and beyond.

**Objective:** This article examines reskilling strategies for AI-driven workforce transformation within the UAE context, analyzing how national policies, employer-led initiatives, and educational reforms intersect to prepare workers for an AI-augmented economy. The study synthesizes global best practices with UAE-specific challenges to identify actionable pathways for equitable and sustainable workforce development.

**Methods:** This study employs a comprehensive literature review and policy analysis approach, synthesizing evidence from 60 peer-reviewed publications, national strategy documents, and institutional reports published between 2019 and 2026. The analysis integrates theoretical frameworks including socio-technical systems theory, human capital theory, and role redesign frameworks to understand the multidimensional nature of workforce transformation. Evidence is drawn from empirical studies, case analyses, and policy evaluations across multiple sectors and geographic contexts, with particular attention to GCC-specific initiatives.

**Results:** The analysis reveals that successful reskilling strategies combine three core elements: skills-first hiring and AI-augmented apprenticeships that rebuild entry pathways; modular lifelong learning systems emphasizing both technical AI literacy and durable human skills; and policy mechanisms incentivizing credential portability and employer co-investment. In the UAE context, initiatives such as the National AI Strategy 2031, high-tech Emiratisation programs, and pilot credential frameworks like SkillChain DX demonstrate alignment with global best practices. However, significant challenges persist, including a 34% workforce skill gap, emerging two-track talent systems risking labor market bifurcation, organizational resistance to sustained training investment, and regulatory gaps in AI governance. The UAE's unique labor market composition—characterized by high expatriate participation and traditional public sector preference among nationals—adds complexity to reskilling implementation.

**Conclusion:** Effective reskilling for AI-driven economies requires coordinated action across multiple stakeholders and policy domains. For the UAE, this means integrating Emiratisation goals with technology-focused workforce development, establishing national skills frameworks with portable microcredentials, funding employer-led apprenticeships through co-investment models, bridging the emerging two-track talent system through mid-career conversion programs, and aligning regulatory frameworks with workforce development objectives. The UAE's substantial financial resources and proactive digitalization provide advantages, but success depends on addressing structural barriers, ensuring inclusive access to reskilling opportunities, and maintaining alignment between education, labor, and industrial policies. These findings offer actionable insights for policymakers and practitioners navigating similar transitions in resource-rich, rapidly developing economies.

**Keywords:** artificial intelligence, workforce reskilling, UAE, Emiratisation, National AI Strategy 2031, human capital development, socio-technical systems, labor market transformation, skills-first hiring, lifelong learning

Volume 8 Issue 1 - 2026

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**Received:** April 18, 2026 | **Published:** April 30, 2026

**Abbreviations:** GCC, gulf cooperation council; AI, artificial intelligence; UAE, United Arab Emirates; MENA, Middle East and North Africa, MBZUAI, mohamed bin zayed university of artificial intelligence.

## Introduction

The global economy stands at a critical inflection point as artificial intelligence (AI) technologies reshape the fundamental nature of work, skill requirements, and labor market dynamics. Unlike

previous waves of technological change, AI's capacity to automate cognitive tasks, augment human decision-making, and create entirely new categories of work presents both unprecedented opportunities and profound challenges for workforce development.<sup>1</sup> Projections suggest that AI automation may displace 15-20% of routine jobs by 2030 while simultaneously creating 25-30% new roles, contributing to 1.2% annual GDP growth and stimulating broader employment opportunities.<sup>2</sup> This dual dynamic of displacement and creation necessitates proactive, comprehensive reskilling strategies that enable workers to transition from at-risk roles into durable, AI-complementary positions.

The United Arab Emirates (UAE) represents a particularly compelling context for examining AI-driven workforce transformation. As a resource-rich nation pursuing ambitious economic diversification goals, the UAE has positioned itself at the forefront of AI adoption in the Middle East and North Africa (MENA) region. The country's National AI Strategy 2031 aims to establish the UAE as a global leader in AI investments, creating high economic value markets across sectors including transportation, healthcare, education, and government.<sup>3</sup> This strategic commitment is reinforced by institutional innovations such as appointing the world's first Minister of State for Artificial Intelligence, establishing the Mohamed bin Zayed University of Artificial Intelligence (MBZUAI), and launching the UAE Council for Artificial Intelligence and Blockchain.<sup>4,5</sup> These initiatives signal a comprehensive national effort to align technological advancement with human capital development.

However, the UAE's workforce transformation occurs within a distinctive socio-economic context that shapes both opportunities and constraints. The country's labor market is characterized by exceptionally high expatriate participation, with foreign workers comprising the majority of the private sector workforce, while Emirati nationals traditionally prefer public sector employment due to better wages, shorter hours, and greater job security.<sup>6</sup> The government's longstanding Emiratisation program—designed to increase national participation in private sector employment—now intersects with AI-driven transformation, creating what Hill (2023) terms “high-tech nationalization” that prioritizes digital and technology-oriented skills. This convergence of nationalization policy and technological change presents unique challenges for reskilling strategy design and implementation.

Moreover, the UAE faces challenges common to rapidly developing economies adopting advanced technologies. These include significant skill gaps affecting 34% of current workforce positions,<sup>7</sup> organizational resistance to sustained training investment, regulatory frameworks that have not fully adapted to AI deployment, and the risk of creating a two-track talent system where elite research talent develops separately from rapidly trained practitioners.<sup>4,5</sup> Addressing these challenges requires evidence-based strategies that integrate global best practices with contextual understanding of the UAE's labor market structure, cultural dynamics, and policy environment.

This article examines reskilling strategies for AI-driven economies through the lens of the UAE context, addressing three central research questions: First, what reskilling strategies have proven effective in preparing workforces for AI-augmented economies, and what theoretical frameworks explain their success? Second, how do the UAE's national policies, labor market characteristics, and institutional initiatives align with or diverge from global best practices? Third, what barriers impede effective reskilling implementation in the UAE context, and what policy interventions can address these obstacles while advancing both economic competitiveness and social equity?

The analysis proceeds through seven main sections. Following this introduction, Section 2 provides a comprehensive literature review covering AI's impact on the future of work, global reskilling trends, and the displacement versus augmentation debate. Section 3 establishes the theoretical foundations by examining socio-technical systems theory, human capital theory, and role redesign frameworks. Section 4 analyzes the UAE context, including Vision 2031, the National AI Strategy 2031, Emiratisation policies, and labor market composition. Section 5 examines specific reskilling strategies implemented in the UAE, including employer-led programs, government initiatives, the NAFIS program, digital skills development, microcredentials, and sector-specific approaches. Section 6 identifies key challenges and barriers, including skill gaps, regulatory gaps, the two-track talent system, organizational resistance, and ethical concerns. Section 7 offers policy recommendations focused on national skills frameworks, co-investment models, credential infrastructure, and bridging the talent divide. The article concludes by synthesizing key findings and outlining priorities for future research and policy development.

## Literature review

### AI and the future of work

The relationship between artificial intelligence and employment has generated substantial scholarly attention, with researchers examining both the magnitude and nature of AI's impact on labor markets. Early influential work by Frey and Osborne established frameworks for assessing job automatability based on task characteristics, while subsequent research by Acemoglu and Restrepo refined these models to distinguish between automation effects that substitute for labor and complementarity effects that augment human capabilities.<sup>8</sup> This evolution in analytical approaches reflects growing recognition that AI's impact operates at the task level rather than the occupation level, with most jobs containing a mix of automatable and augmentation-suitable tasks.<sup>9</sup>

Empirical evidence increasingly supports a nuanced view of AI's employment effects. Karim,<sup>10</sup> demonstrates that while AI displaces repetitive job functions, it simultaneously creates opportunities for innovation and human-machine collaboration, necessitating robust reskilling initiatives and interdisciplinary collaboration. A comprehensive multi-sector analysis by Chhibber et al.,<sup>11</sup> found that 57% of workers report task augmentation rather than replacement, suggesting that AI primarily reshapes job functions rather than eliminating positions entirely. However, this aggregate finding masks significant sectoral and skill-level variation, with medium-skilled workers experiencing disproportionately negative effects.<sup>12</sup>

The displacement versus augmentation debate has profound implications for workforce development strategy. Shoib,<sup>13</sup> emphasizes that recognizing the distinction between AI automation and augmentation is critical for crafting human-centered reskilling approaches, arguing that while automation may reduce task complexity, augmentation often necessitates reskilling that leads to greater empowerment and innovation. This perspective aligns with Hutson's,<sup>1</sup> framework proposing a shift from task replacement to role redesign, where workforce strategy focuses on embedding technical AI literacy alongside communication, critical thinking, adaptability, and collaboration—what the literature increasingly terms “durable skills.”

The temporal dimension of AI's impact also warrants attention. Projections suggest accelerating change, with estimates that 50% of employees will need reskilling by 2025 due to new technologies.<sup>14</sup> This compressed timeline creates urgency for developing scalable, effective

reskilling mechanisms. Furthermore, the geographic distribution of AI's impact varies substantially, with developing economies facing distinct challenges related to limited access to training infrastructure, structural labor market rigidities, and skill mismatches.<sup>15</sup>

### Global reskilling trends and best practices

Effective reskilling strategies share several common elements across diverse contexts. Westover,<sup>16</sup> identifies four critical components of successful initiatives: transparent role evolution mapping that helps workers understand how their positions will change; individualized learning pathways tailored to specific career trajectories; psychologically safe experimentation spaces where employees can test AI tools without penalty; and institutional commitment to internal mobility that provides concrete advancement opportunities. Organizations implementing these comprehensive programs achieve higher retention rates, faster AI adoption, and sustained competitive advantage.

The modular lifelong learning approach has gained particular traction as a response to continuous technological change. This model emphasizes microcredentials and stacked certifications that enable workers to reskill incrementally across career stages rather than through discrete, front-loaded educational experiences.<sup>17</sup> The effectiveness of this approach depends critically on credential portability—the ability of workers to transfer validated skills across employers and sectors—which in turn requires standardized frameworks and employer trust in credential quality.

Employer-educator partnerships represent another key trend in global reskilling efforts. These collaborations align curricula with firm needs through co-designed programs and bootcamps, shortening time-to-productivity and ensuring relevance.<sup>18</sup> Successful examples include the U.S. Army and Carnegie Mellon University partnership that trained 59 AI technicians through alternative occupational training methods, demonstrating the feasibility of intensive, targeted programs.<sup>14</sup> Such partnerships often incorporate blended delivery combining online learning with workplace application, mentorship and coaching, competency assessments, and explicit linkage of reskilling outcomes to promotion or redeployment metrics.

The skills-first hiring movement complements reskilling efforts by opening entry pathways based on demonstrated competencies rather than formal credentials. This approach values learning outcomes over degrees, potentially expanding access to AI-related roles for workers from non-traditional backgrounds.<sup>1</sup> However, implementing skills-first hiring requires robust assessment mechanisms and organizational willingness to reconsider traditional qualification requirements.

Sector-specific approaches have emerged as important complements to general reskilling frameworks. For instance, Jain et al.,<sup>19</sup> found that tailored, industry-specific training programs for AI-driven voice search technologies significantly enhanced workforce readiness, enabling organizations to leverage voice AI for improved customer engagement and operational efficiency. This finding suggests that while foundational AI literacy has broad applicability, effective reskilling often requires domain-specific technical knowledge and use-case understanding.

### The displacement versus augmentation debate

The conceptual distinction between AI as a displacement technology versus an augmentation technology carries significant implications for workforce strategy. Displacement perspectives emphasize AI's capacity to substitute for human labor in specific tasks, potentially leading to technological unemployment or wage

polarization. Augmentation perspectives, by contrast, focus on AI's potential to enhance human capabilities, enabling workers to perform higher-value activities and make better decisions.<sup>13</sup>

Empirical evidence suggests both dynamics operate simultaneously, with outcomes depending on implementation choices. Aggarwal,<sup>20</sup> argues that AI-augmented workplaces necessitate employer-led initiatives supporting skilling, upskilling, and reskilling programs that stress cross-disciplinary capabilities and modular, lifelong learning. This approach aims for augmentation over replacement, fostering human-AI cooperation rather than competition. The key insight is that augmentation outcomes are not automatic but require deliberate organizational practices, including role redesign, training investment, and cultural change that values experimentation and learning.

The displacement-augmentation balance also varies by worker characteristics. Graph-based analysis of 10,000 Egyptian jobs by Dawoud et al.,<sup>21</sup> found that only 24.4% of at-risk workers have viable transition pathways, with the remaining 75.6% requiring comprehensive reskilling due to structural mobility barriers. Among feasible transitions, process-oriented skills emerged as the highest-leverage intervention, appearing in 15.6% of pathways. These findings challenge optimistic narratives of seamless adaptation, suggesting that emerging economies require active pathway creation rather than passive skill matching.

The debate also encompasses distributional concerns. Multiple studies identify gender disparities in AI's impact, with 41% of women's jobs at risk compared to 28% of men's, necessitating targeted intervention strategies.<sup>22</sup> Similarly, medium-skilled workers face concentrated negative effects, indicating a critical need for targeted reskilling efforts.<sup>12</sup> These patterns suggest that without proactive policy intervention, AI adoption may exacerbate existing labor market inequalities.

Ultimately, the literature converges on the view that whether AI displaces or augments human labor depends substantially on institutional choices regarding training investment, role design, and labor market policy. As Mehan,<sup>23</sup> emphasizes, navigating AI-driven workforce transformation requires individuals and organizations to prioritize continuous learning and reskilling, developing versatile skill sets including digital literacy, critical thinking, adaptability, and emotional intelligence. Educational programs and policies must be shaped to foster these competencies, ensuring individuals can acquire new skills and adapt to evolving job requirements.

## Theoretical framework

### Socio-technical systems theory

Socio-technical systems theory provides a foundational lens for understanding AI-driven workforce transformation by treating technological change as inherently coupled with social, organizational, and institutional dynamics. This perspective rejects technological determinism—the notion that technology alone dictates outcomes—in favor of recognizing that technology deployment occurs within complex systems where human choices, organizational structures, regulatory frameworks, and cultural norms shape implementation and impact.<sup>4,5</sup>

Applied to the GCC context, socio-technical systems theory emphasizes the importance of aligning AI investments with governance mechanisms, regulatory frameworks, and incentive structures. Albous et al.,<sup>4,5</sup> demonstrate that regulatory coherence plausibly binds workforce outcomes more than fiscal capacity alone, suggesting that

even resource-rich nations require coordinated policy frameworks to translate AI investments into positive employment outcomes. These findings challenge assumptions that financial resources automatically ensure successful workforce transitions, highlighting instead the critical role of institutional design.

The socio-technical perspective also illuminates the emergence of unintended consequences from technology adoption. For instance, the risk of a two-track talent system—where elite research talent develops separately from rapidly trained practitioners—represents a socio-technical outcome arising from the interaction of educational institutions, labor market structures, and employer hiring practices.<sup>4,5</sup> Addressing such challenges requires interventions that span multiple system levels, from curriculum design to labor market regulation to employer incentives.

Furthermore, socio-technical systems theory directs attention to the importance of stakeholder participation and co-design in technology implementation. Successful AI adoption depends not only on technical capabilities but also on worker acceptance, organizational readiness, and alignment with existing work practices. This insight supports the emphasis in the reskilling literature on psychologically safe experimentation spaces and participatory role redesign processes.<sup>16</sup>

### Human capital theory

Human capital theory conceptualizes education, training, and skill development as investments that enhance individual productivity and earning potential while contributing to aggregate economic growth. In the context of AI-driven transformation, human capital theory provides a framework for understanding why reskilling investments are economically rational for individuals, firms, and governments, while also highlighting potential market failures that may lead to underinvestment.

From an individual perspective, human capital theory predicts that workers will invest in reskilling when the expected returns—in terms of higher wages, employment security, or career advancement—exceed the costs of training, including direct expenses and opportunity costs of time. However, several factors may impede optimal individual investment. Uncertainty about which skills will remain valuable as AI evolves creates information problems. Credit constraints may prevent workers from financing training. And the risk that employers will not recognize or reward newly acquired skills reduces expected returns.

For employers, human capital theory suggests investment in worker reskilling when the productivity gains exceed training costs and when firms can capture sufficient returns before workers leave. However, the risk of trained workers being poached by competitors creates a classic externality problem, potentially leading to underinvestment in general skills transferable across employers. This market failure provides economic justification for government intervention through training subsidies, co-investment programs, or credential standardization that reduces information asymmetries.

At the national level, human capital theory frames workforce development as a critical determinant of economic competitiveness and growth. The UAE's substantial investments in AI education infrastructure, including MBZUAI, reflect recognition that human capital development is essential for realizing returns on AI technology investments.<sup>4,5</sup> However, the theory also highlights potential mismatches between educational supply and labor market demand, particularly in rapidly evolving technological contexts where educational institutions may lag industry needs.

Recent extensions of human capital theory emphasize the importance of “learning to learn” capabilities and adaptability as meta-skills that enable continuous reskilling across the career lifecycle. This perspective aligns with the literature's emphasis on lifelong learning systems and modular credentials that support ongoing skill acquisition rather than one-time educational investments.<sup>17</sup>

### Role redesign framework

The role redesign framework shifts analytical focus from jobs as fixed bundles of tasks to jobs as dynamic configurations that can be restructured to optimize human-AI collaboration. This perspective, articulated most clearly by Hutson,<sup>1</sup> proposes that effective workforce adaptation requires moving from task replacement logic to role redesign logic, where the goal is not to automate humans out of work but to reconfigure work to leverage complementary strengths of humans and AI systems.

Role redesign begins with task-level analysis to identify which activities are best suited for automation, which benefit from AI augmentation, and which require distinctively human capabilities such as complex communication, ethical judgment, creative problem-solving, or emotional intelligence. Frank et al.,<sup>9</sup> emphasize that occupations are best understood as abstract bundles of skills, with technology directly impacting specific skills rather than entire occupations. This granular perspective enables more precise identification of reskilling needs and transition pathways.

The framework emphasizes several key principles for effective role redesign. First, transparency in role evolution mapping helps workers understand how their positions will change and what new capabilities they need to develop.<sup>16</sup> Second, individualized learning pathways recognize that workers in the same occupation may have different baseline skills and career aspirations, requiring tailored development plans. Third, experimentation and iteration are essential, as optimal human-AI task allocation often emerges through trial and learning rather than upfront design. Fourth, role redesign must attend to job quality dimensions including autonomy, skill utilization, and meaningfulness, not just productivity metrics.

Implementing role redesign requires organizational capabilities beyond traditional training programs. Organizations need processes for ongoing job analysis, mechanisms for worker input into redesign decisions, and cultures that support experimentation and learning from failure. Westover,<sup>16</sup> found that organizations implementing comprehensive role redesign programs—including transparent mapping, individualized pathways, safe experimentation spaces, and mobility commitments—achieved higher retention rates and faster AI adoption than those focusing narrowly on technical training.

The role redesign framework also has implications for educational institutions. Rather than training workers for specific jobs that may not exist in five years, education should develop foundational capabilities that enable workers to participate effectively in ongoing role redesign processes. This includes technical AI literacy, but also communication skills for articulating how work should be restructured, critical thinking for evaluating AI system outputs, and adaptability for navigating continuous change.<sup>1</sup>

Collectively, these three theoretical frameworks—socio-technical systems theory, human capital theory, and role redesign frameworks—provide complementary lenses for understanding AI-driven workforce transformation. Socio-technical systems theory emphasizes the institutional and regulatory context shaping technology deployment. Human capital theory explains investment incentives and potential

market failures in skill development. Role redesign frameworks offer practical guidance for restructuring work to optimize human-AI collaboration. Together, they inform the analysis of UAE-specific reskilling strategies and policy recommendations developed in subsequent sections.

## The UAE context

### Vision 2031 and national development goals

The UAE's Vision 2031 represents a comprehensive national development framework aimed at transitioning the country from an oil-dependent economy to a diversified, knowledge-based economy positioned for long-term prosperity. Workforce development constitutes a central pillar of this vision, with explicit goals to enhance human capital quality, increase national participation in high-value sectors, and establish the UAE as a global hub for talent and innovation. The vision emphasizes creating a competitive knowledge economy, developing a cohesive society and preserved identity, and ensuring sustainable environment and infrastructure.

Within this broader framework, AI and digital transformation occupy strategic priority positions. The UAE government has articulated an explicit goal to achieve 100% AI reliance in services and data analysis by 2031, linking this objective to the UAE Centennial 2071 strategy to establish world-leading capabilities.<sup>24</sup> This ambitious target reflects recognition that AI capabilities will increasingly determine national competitiveness across economic sectors, from traditional industries like energy and transportation to emerging domains like smart cities and personalized healthcare.

The Vision 2031 framework explicitly connects technological advancement with human transformation. As Ismail et al.,<sup>25</sup> note, the challenge for the UAE and broader MENA region is translating digital transformation into human transformation—ensuring that technology adoption enhances rather than displaces human capabilities and opportunities. This requires coordinated action across education, labor market policy, and social protection systems to ensure inclusive benefits from technological change.

### National AI strategy 2031

The UAE's National AI Strategy 2031, launched in 2017, aims to position the country as a global leader in AI by 2031 through comprehensive action across multiple domains. The strategy identifies nine priority sectors for AI application: transportation, health, space, renewable energy, water, technology, education, environment, and traffic.<sup>3</sup> For each sector, the strategy outlines specific use cases, implementation roadmaps, and performance metrics designed to drive adoption and measure progress.

Workforce development features prominently in the National AI Strategy through several mechanisms. First, the strategy emphasizes talent attraction, seeking to draw leading AI researchers and practitioners to the UAE through competitive compensation, research funding, and quality of life amenities. The establishment of MBZUAI as a graduate-level research university focused exclusively on AI represents a flagship initiative in this domain, aiming to produce both research breakthroughs and a pipeline of highly skilled AI specialists.<sup>4,5</sup>

Second, the strategy prioritizes ecosystem development, including accelerators, innovation labs, and public-private partnerships that create opportunities for AI skill application and development. The UAE Council for Artificial Intelligence and Blockchain serves as a

coordinating body to align initiatives across government entities and facilitate collaboration with private sector actors.<sup>3</sup>

Third, the strategy emphasizes human-centric AI development that addresses the UAE's unique cultural and linguistic context. Initiatives like Jais, a large Arabic language model, demonstrate commitment to ensuring AI systems serve the UAE population effectively while creating opportunities for local talent to contribute to cutting-edge AI development.<sup>4,5</sup>

However, the National AI Strategy also faces implementation challenges. Albous et al.,<sup>4,5</sup> note that while the UAE's strategy is comprehensive in scope, regulatory frameworks remain less prescriptive than in some other jurisdictions, focusing on innovation over robust enforcement. This approach may accelerate adoption but creates potential gaps in worker protection, algorithmic accountability, and ethical oversight. Additionally, persistent data limitations and significant skills gaps constrain the strategy's implementation, requiring sustained investment in both technical infrastructure and human capital development.

### Emiratisation and labor market dynamics

Emiratisation—the UAE government's longstanding policy to increase national participation in private sector employment—intersects critically with AI-driven workforce transformation. Historically, Emiratisation has faced persistent challenges due to structural features of the UAE labor market. Emirati nationals have traditionally preferred public sector employment, which offers better wages, shorter working hours, greater job security, and cultural alignment.<sup>6</sup> The private sector, by contrast, has relied heavily on expatriate workers who comprise the majority of the workforce and often accept lower wages and less favorable conditions than nationals expect.

Hill,<sup>26</sup> proposes a “high-tech nationalization” approach that reframes Emiratisation around digital and technology-oriented skills rather than simply increasing national employment numbers in existing private sector roles. This approach aligns Emiratisation with the UAE's economic diversification and AI adoption goals, positioning nationals at the forefront of technology-oriented economic development. The logic is that by focusing on high-value, technology-intensive roles, Emiratisation can simultaneously advance national employment goals and economic competitiveness while creating positions more attractive to Emirati nationals than traditional private sector jobs.

This high-tech nationalization approach requires substantial reskilling investment to ensure nationals possess the digital and AI-related competencies demanded in technology-intensive roles. It also necessitates cultural change to increase national interest in private sector technology careers and employer willingness to invest in national talent development. The government has implemented various policy levers to support this transition, including wage subsidies for employers hiring nationals, employment quotas in specific sectors, and funding for training programs.<sup>6</sup>

However, challenges persist. The UAE labor market's two-tier structure—with nationals concentrated in public sector roles and expatriates dominating private sector employment—creates path dependencies that are difficult to overcome. Fresh graduates may have unrealistic expectations about entry-level positions, while employers may perceive nationals as more expensive or less flexible than expatriate alternatives.<sup>6</sup> Additionally, cultural factors, such as hesitation to join certain industries like hospitality due to alcohol

service and family concerns, limit the sectors where Emiratisation can readily expand.

The intersection of Emiratisation with AI adoption also raises questions about the distribution of reskilling opportunities and resources. If high-tech nationalization focuses primarily on elite talent pipelines—such as MBZUAI graduates—while broader national populations lack access to quality AI-related training, the policy may exacerbate rather than reduce inequality among nationals. Ensuring inclusive access to reskilling opportunities represents a critical challenge for policy design.

### Labor market composition and skill gaps

The UAE's labor market exhibits distinctive compositional features that shape reskilling strategy requirements. Expatriates comprise approximately 88% of the total population and an even higher proportion of the private sector workforce, creating a highly diverse labor market with workers from over 200 nationalities.<sup>6</sup> This diversity brings advantages in terms of skill variety and global connections but also creates challenges for coordinated workforce development, as expatriate workers may have limited incentives to invest in UAE-specific skills if they anticipate eventual return to home countries.

Sectoral employment patterns reveal concentration in construction, retail, hospitality, and business services, with emerging growth in technology, finance, and healthcare. The public sector remains the largest employer of Emirati nationals, accounting for the majority of national employment. This sectoral distribution has implications for reskilling priorities, as different sectors face varying degrees of AI disruption and require distinct skill profiles.

Skill gap assessments indicate substantial challenges. Henry et al.<sup>7</sup> report that skill gaps affect 34% of current workforce positions, while Olaniyi et al.<sup>27</sup> found that 69% of respondents in a digital workforce study identified significant skills gaps necessitating urgent educational and training interventions. These gaps span both technical AI-related competencies and broader digital literacy, with particular shortages in data science, machine learning, AI system implementation, and AI-augmented decision-making.

The skill gap challenge is compounded by rapid technological change that continuously shifts skill requirements. Traditional educational institutions often lag industry needs, creating mismatches between graduate capabilities and employer requirements. This dynamic strengthens the case for modular, continuous learning systems that can adapt more quickly than degree programs, as well as for employer-educator partnerships that align training with current industry needs.

Additionally, the UAE faces challenges in AI-specific human capital development. Albous et al.<sup>4,5</sup> identify persistent data limitations and significant skills gaps as key constraints on AI strategy implementation, noting that cultivating AI-specific human capital requires sustained investment and time. The establishment of MBZUAI addresses part of this challenge by creating a domestic pipeline of advanced AI talent, but broader workforce AI literacy remains a work in progress.

## Reskilling strategies in the UAE

### Employer-led programs and private sector initiatives

Employer-led reskilling programs represent a critical component of the UAE's workforce development ecosystem, with major

corporations and SMEs increasingly recognizing that talent development is essential for AI adoption and competitive advantage. Leading UAE organizations have implemented various program models, often in partnership with technology vendors, educational institutions, or specialized training providers.

Large enterprises in sectors such as aviation, energy, and finance have pioneered comprehensive reskilling initiatives. For example, Emirates Airlines and ENOC have applied AI in predictive analytics, automation, and decision-making to address economic resilience and digital transformation challenges, requiring substantial workforce upskilling to operate and optimize these systems.<sup>28</sup> These programs typically combine technical training in specific AI tools with broader change management and digital literacy components.

The effectiveness of employer-led programs depends significantly on program design features. Successful initiatives integrate several elements identified in the global literature: transparent communication about role evolution and career pathways; individualized learning plans that account for workers' baseline skills and aspirations; blended delivery combining online learning with workplace application; mentorship and coaching to support skill transfer; and explicit linkage of reskilling completion to promotion, redeployment, or compensation outcomes.<sup>16</sup>

However, employer-led programs also face constraints. Organizational resistance to sustained training investment, competing budget priorities, and concerns about trained workers being poached by competitors can limit program scope and duration.<sup>29</sup> SMEs, in particular, often lack the resources and expertise to design and deliver effective reskilling programs, creating disparities in access to training opportunities based on employer size and sector.

### Government initiatives and public sector programs

The UAE government has launched multiple initiatives to support workforce reskilling for the AI era, operating through various ministries, agencies, and public institutions. These programs aim to complement employer-led efforts while addressing market failures that may lead to underinvestment in training.

The Ministry of Human Resources and Emiratisation plays a central coordinating role, implementing policies that incentivize employer investment in national talent development while directly providing training programs for job seekers and employed workers seeking to transition to new roles. Government support includes targeted policies, funding initiatives, and incentives designed to facilitate AI integration and address adoption barriers.<sup>29</sup>

Public sector organizations have also reevaluated business practices and workforce development approaches in response to technological change and external shocks like the COVID-19 pandemic, prompting new approaches to public service provision and employee skill development.<sup>30</sup> Digital HR initiatives aim to integrate AI literacy and human capital planning across government entities, aligning with Vision 2031 and the National AI Strategy 2031.<sup>31</sup>

Educational institutions, particularly public universities and technical colleges, have expanded AI-related curricula and continuing education offerings. MBZUAI represents the flagship initiative, but broader efforts include integrating AI modules into existing degree programs, offering professional certificates in AI applications, and partnering with employers to deliver customized training. However, the pace of curriculum adaptation often lags industry needs, highlighting the importance of agile, modular learning systems.

## NAFIS and national employment programs

NAFIS (National In-Service Fellowship Scheme) represents a significant government initiative aimed at enhancing Emirati employment in the private sector through comprehensive support including training, career counseling, and financial incentives. While not exclusively focused on AI-related skills, NAFIS incorporates digital competency development as a core component, recognizing that technology skills are increasingly essential across all sectors.

The program provides several forms of support to both job seekers and employers. For nationals, NAFIS offers skills assessments to identify development needs, access to training programs covering both technical and soft skills, job matching services connecting candidates with suitable positions, and financial support during training and early employment periods. For employers, the program provides wage subsidies to offset the cost of hiring and training nationals, reducing the perceived risk of investing in national talent.

NAFIS's effectiveness in supporting AI-related reskilling depends on several factors. First, the quality and relevance of training offerings must align with actual employer needs in AI-adopting sectors. Second, the program must successfully attract participation from both high-potential nationals and employers in technology-intensive industries. Third, support mechanisms must extend beyond initial placement to ensure retention and career progression, as early turnover undermines both individual and employer investment.

Integration with other workforce development initiatives is also critical. NAFIS operates most effectively when coordinated with educational institution outputs, employer-led training programs, and broader Emiratisation policies to create coherent pathways from education through employment to career advancement in technology-oriented roles.

## Digital skills development and AI literacy programs

Recognizing that AI adoption requires broad-based digital literacy alongside specialized technical skills, the UAE has invested in programs aimed at enhancing digital competencies across the workforce. These initiatives target multiple skill levels, from foundational digital literacy for workers in traditional sectors to advanced AI implementation capabilities for technology specialists.

Foundational digital literacy programs focus on ensuring all workers can effectively use digital tools, understand basic data concepts, and adapt to technology-mediated work processes. This baseline capability is essential for workers in sectors undergoing digital transformation, even when they are not directly working with AI systems. Programs are delivered through various channels including online platforms, community centers, and workplace training.

Intermediate AI literacy programs aim to develop understanding of AI capabilities, limitations, and appropriate applications across various job functions. These programs typically cover topics such as how AI systems work, how to interpret AI-generated insights, how to identify suitable AI use cases, and how to collaborate effectively with AI systems. The goal is not to create AI specialists but to enable workers across functions to participate in AI-augmented work processes.

Advanced technical programs target workers who will implement, customize, or manage AI systems. These programs cover machine learning fundamentals, specific AI tools and platforms, data preparation and management, model evaluation, and AI system integration. Delivery often occurs through intensive bootcamps, university certificates, or vendor-specific training programs.

The UAE has also explored innovative delivery mechanisms to enhance access and effectiveness. Online platforms enable flexible, self-paced learning suitable for working adults. Blended models combine online content with in-person workshops or workplace application projects. Microcredentials and digital badges provide granular recognition of specific competencies, supporting the modular learning approach emphasized in the literature.

## Micro credentials and alternative certification pathways

The UAE has begun piloting alternative credential systems designed to enhance skill portability, reduce information asymmetries between workers and employers, and enable more flexible, modular learning pathways. These initiatives respond to limitations of traditional degree-based credentials, which often provide insufficient granularity about specific competencies and require multi-year commitments unsuitable for rapid reskilling.

The SkillChain DX initiative represents a notable example, proposing a policy framework for AI-driven talent mapping and blockchain-based credential validation in Dubai Government. This system aims to create verifiable, portable records of worker competencies that can be trusted by employers and used by workers to demonstrate capabilities acquired through diverse learning experiences. The blockchain foundation provides tamper-resistance and enables workers to control access to their credential data.

Micro credentials—focused certifications recognizing specific, granular competencies—have gained traction as complements or alternatives to traditional degrees. These credentials can be earned through shorter-duration programs, stacked to build toward larger qualifications, and updated more readily as skill requirements evolve. For AI-related skills, micro credentials might recognize competencies such as “Python for data analysis,” “machine learning model evaluation,” or “AI ethics and governance.”

The effectiveness of alternative credentials depends critically on employer recognition and trust. If employers do not value micro credentials or cannot easily assess their quality, workers have limited incentive to pursue them. This creates a coordination challenge requiring standards development, quality assurance mechanisms, and employer engagement to build confidence in alternative credentials.

Integration with traditional educational credentials is also important. Rather than replacing degrees, micro credentials work best as complements that provide more granular skill signalling and enable continuous updating of capabilities throughout careers. Educational institutions can play important roles by offering micro credentials aligned with degree programs, recognizing external micro credentials for degree credit, and helping establish quality standards.

## Sector-specific approaches and industry partnerships

Recognizing that effective reskilling often requires domain-specific knowledge and use-case understanding, the UAE has encouraged sector-specific workforce development initiatives, often structured as partnerships between government, educational institutions, and industry actors. These initiatives tailor training content, delivery mechanisms, and credential structures to the particular needs of sectors such as healthcare, finance, logistics, and smart cities.

In healthcare, AI applications span medical imaging analysis, predictive diagnostics, treatment optimization, and administrative automation. Reskilling programs for healthcare workers must therefore address both technical AI literacy and domain-specific applications, while also attending to ethical considerations around patient privacy,

algorithmic bias, and clinical decision-making authority. Partnerships between health authorities, medical schools, and technology providers have developed specialized training programs addressing these multifaceted requirements.

The financial sector has similarly developed targeted reskilling initiatives focused on AI applications in fraud detection, credit risk assessment, algorithmic trading, and customer service automation. These programs must address both technical capabilities and regulatory compliance requirements specific to financial services, necessitating close collaboration between financial institutions, regulators, and training providers.

Smart cities and government services represent another priority domain, with AI applications in traffic management, energy optimization, public safety, and citizen services. The UAE's smart city initiatives in Dubai and Abu Dhabi have created demand for workers who understand both AI technologies and public sector contexts, leading to specialized training programs often delivered through public-private partnerships.

Sector-specific approaches offer several advantages. Training content directly addresses the use cases and challenges workers will encounter, enhancing relevance and transfer. Industry partners can provide authentic learning environments, mentorship, and employment pathways. Credentials can be tailored to sector-specific competency requirements, improving employer recognition. However, sector-specific programs also risk creating siloed skill sets with limited transferability, highlighting the importance of balancing domain-specific and general AI competencies.

## Challenges and barriers

### Persistent skill gaps and capacity constraints

Despite substantial investment in workforce development, significant skill gaps persist across the UAE labor market, constraining AI adoption and limiting the effectiveness of reskilling initiatives. As noted earlier, skill gaps affect 34% of current workforce positions,<sup>7</sup> with particularly acute shortages in technical AI competencies such as machine learning, data science, and AI system implementation.

These gaps reflect multiple underlying challenges. First, the rapid pace of AI technological change continuously shifts skill requirements, creating a moving target for educational institutions and training programs. Skills that are current today may become obsolete within a few years, necessitating continuous updating that traditional educational models struggle to provide. Second, the UAE's relatively small national population limits the domestic talent pool, creating dependence on expatriate workers for specialized skills. While this dependence is not inherently problematic, it creates challenges for long-term human capital development and knowledge retention.

Third, capacity constraints in training delivery limit the scale and reach of reskilling programs. The number of qualified instructors for advanced AI topics is limited, creating bottlenecks in program expansion. Training infrastructure, including computing resources and access to real-world datasets for hands-on learning, may be insufficient to meet demand. And coordination challenges across multiple training providers can lead to duplication, gaps, and inconsistent quality.

Fourth, baseline digital literacy gaps among portions of the workforce create barriers to accessing AI-related training. Workers lacking foundational digital skills cannot effectively participate in intermediate or advanced AI programs, necessitating remedial

training that extends timelines and increases costs. This challenge is particularly acute for older workers, workers in traditional sectors, and workers with limited formal education.

### Regulatory gaps and legal uncertainty

The UAE's regulatory framework for AI, while evolving, contains gaps that create uncertainty for employers and workers navigating AI adoption and workforce transformation. AL-Louzi et al.,<sup>24</sup> note that current legislation regarding artificial intelligence does not appear sufficient, necessitating new legislative provisions to control dealings at local and international levels. The lack of specific legislation directly regulating AI and its uses leads to potential legal insecurity.

Several regulatory domains require attention. First, employment law must adapt to address AI-related workplace changes, including algorithmic management, AI-assisted hiring and performance evaluation, and worker rights regarding AI system transparency and contestability. Current frameworks may not adequately protect workers from algorithmic bias or provide recourse when AI systems make consequential employment decisions.

Second, data protection and privacy regulations must balance enabling AI development—which requires access to substantial data—with protecting individual privacy and preventing misuse. The UAE has made progress in this domain but faces ongoing challenges in enforcement and keeping pace with technological change.

Third, liability frameworks must clarify responsibility when AI systems cause harm or make errors. Questions about whether employers, AI developers, or other parties bear liability for AI system failures create uncertainty that may inhibit adoption or lead to inadequate safeguards.

Fourth, credential recognition and quality assurance for alternative credentials require regulatory attention. Without clear standards and oversight mechanisms, the proliferation of microcredentials and alternative certifications may create confusion rather than clarity about worker capabilities.

Albous et al.,<sup>4,5</sup> note that the UAE's regulatory approach has focused on innovation over robust enforcement, which may accelerate adoption but creates potential gaps in worker protection, algorithmic accountability, and ethical oversight. Balancing innovation promotion with adequate safeguards represents an ongoing policy challenge.

### The two-track talent system and labor market bifurcation

A critical challenge identified in the literature is the risk of creating a two-track talent system where elite research talent develops separately from rapidly trained practitioners, potentially leading to labor market bifurcation without bridging mechanisms.<sup>4,5</sup> This dynamic manifests in several ways in the UAE context.

First, flagship initiatives like MBZUAI create pathways for exceptional talent to develop cutting-edge AI research capabilities and access elite career opportunities. While valuable, these programs serve a small fraction of the workforce. If broader populations lack access to quality AI-related training, a gap emerges between a small elite with advanced capabilities and a large population with limited AI skills, potentially exacerbating inequality.

Second, the intersection of high-tech Emiratisation with traditional labor market segmentation may create a three-tier system: elite national talent in advanced AI roles, broader national populations in

traditional public sector positions, and expatriate workers in private sector roles with varying AI exposure. This structure could entrench rather than reduce labor market stratification.

Third, sectoral variation in reskilling access creates disparities. Workers in large enterprises or high-priority sectors may have substantial training opportunities, while those in SMEs or traditional sectors have limited access. Geographic concentration of training resources in major cities like Dubai and Abu Dhabi may disadvantage workers in other emirates.

Fourth, the rapid upskilling of some workers coexists with large cohorts lacking pathways, producing the two-track system that risks inequality and underemployment.<sup>4,5</sup> Dawoud et al.'s,<sup>21</sup> finding that only 24.4% of at-risk workers have viable transition pathways, with 75.6% requiring comprehensive reskilling due to structural mobility barriers, suggests that without active pathway creation, many workers will be left behind.

Addressing this challenge requires deliberate policy interventions to ensure inclusive access to reskilling opportunities, create bridging programs that enable mid-career transitions, and prevent the consolidation of a permanent underclass of workers unable to participate in the AI-augmented economy.

### Organizational resistance and resource constraints

Organizational-level barriers significantly impede reskilling implementation, even when national policies and funding are supportive. Al-Jenaibi et al.,<sup>29</sup> identify organizational resistance to change, limited budgets for sustained training, and competing priorities as factors that reduce program reach and effectiveness.

Resistance to change manifests in several forms. Managers may be skeptical about AI's value or concerned about disruption to established processes, leading to limited support for reskilling initiatives. Workers may fear that AI adoption threatens their job security, creating anxiety that impedes learning and experimentation. Organizational cultures that do not value continuous learning or that penalize failure discourage the experimentation necessary for effective AI integration.

Resource constraints operate at multiple levels. Training programs require direct financial investment in instructors, materials, and infrastructure. They also impose opportunity costs, as time spent in training is time not spent on productive work. For SMEs operating on thin margins, these costs may be prohibitive. Even large organizations face budget constraints and must prioritize among competing investments, with training sometimes losing out to more immediately pressing needs.

The risk of trained workers being poached by competitors creates a classic externality problem that may lead to underinvestment. Employers who invest substantially in worker training may see those workers recruited by competitors offering higher wages, resulting in the training employer bearing costs while competitors capture benefits. This dynamic is particularly acute for general AI skills that are transferable across employers, as opposed to firm-specific capabilities.

Coordination challenges also impede organizational reskilling efforts. Effective programs require collaboration across HR, IT, operations, and line management, but these functions may have different priorities and limited communication. Lack of clear ownership for reskilling initiatives can lead to fragmented efforts with limited impact.

### Ethical concerns and workforce anxiety

Ethical considerations and workforce anxiety represent important but sometimes overlooked barriers to effective AI adoption and reskilling. Workers' concerns about bias, privacy, job security, and the changing nature of work can impede engagement with reskilling programs and create resistance to AI implementation.

Algorithmic bias concerns are particularly salient in employment contexts. If workers perceive that AI systems used for hiring, performance evaluation, or task assignment exhibit bias based on nationality, gender, age, or other characteristics, trust in both the technology and the organization erodes. This is especially relevant in the UAE's diverse workforce, where workers from different nationalities may have concerns about fair treatment.

Privacy concerns arise when AI systems monitor worker activities, analyze communications, or make inferences about worker characteristics and behaviors. While such monitoring may serve legitimate purposes like productivity optimization or security, it can also feel invasive and create anxiety about surveillance. Clear policies about what data is collected, how it is used, and what protections exist are essential for maintaining trust.

Job security anxiety represents perhaps the most fundamental concern. Even when organizations communicate that AI will augment rather than replace workers, employees may remain sceptical, particularly if they observe automation eliminating positions in other organizations or sectors. This anxiety can manifest as resistance to reskilling programs, as workers may question why they should invest effort in learning to work with technology they fear will eventually displace them.

The changing nature of work itself can be unsettling. AI adoption often requires workers to shift from executing well-defined tasks to managing exceptions, interpreting AI outputs, and making judgment calls in ambiguous situations. This transition can be uncomfortable for workers accustomed to more structured roles, requiring not just technical reskilling but also psychological adjustment and support.

Addressing these ethical concerns and anxieties requires transparent communication, meaningful worker participation in AI implementation decisions, clear policies protecting worker rights and privacy, and demonstrated organizational commitment to worker development and retention. As Westover,<sup>16</sup> emphasizes, psychologically safe experimentation spaces where employees can test AI tools without penalty are essential for accelerating adoption and learning.

## Policy recommendations

### Establishing a national skills framework

The UAE should develop a comprehensive national skills framework that maps AI and durable skills across sectors, standardizes competency definitions, and provides a common language for educational institutions, employers, and workers. Such a framework would address several current challenges including inconsistent skill definitions across training providers, difficulty for employers in assessing candidate capabilities, and limited portability of credentials across employers and sectors.

The framework should identify core competency domains spanning technical AI skills (e.g., machine learning, data analysis, AI system implementation), digital literacy (e.g., data interpretation, digital tool proficiency, cybersecurity awareness), and durable human skills

(e.g., critical thinking, complex communication, adaptability, ethical reasoning). For each domain, the framework should define proficiency levels from foundational to advanced, with clear descriptions of what individuals at each level can do.

Importantly, the framework should be developed through multi-stakeholder collaboration involving government agencies, employers across sectors, educational institutions, and worker representatives. This participatory approach ensures the framework reflects actual labor market needs while building buy-in from key stakeholders. International alignment with frameworks from other jurisdictions can enhance credential portability for the UAE's globally mobile workforce.

The national skills framework should be integrated with credential systems, enabling training providers to map their offerings to framework competencies and employers to specify requirements using framework language. This integration would enhance transparency, reduce information asymmetries, and support the modular learning pathways emphasized in the literature.<sup>1</sup>

### Co-investment models and employer incentives

To address the market failure whereby employers underinvest in worker training due to poaching risks, the UAE should expand co-investment models where government shares the cost of employer-led reskilling programs. Such models reduce employer risk while ensuring training aligns with actual workplace needs and includes authentic application opportunities.

Co-investment programs should prioritize apprenticeship and bootcamp models that combine workplace learning with accredited credentials. These programs enable workers to earn while learning, reducing the opportunity cost of training, while giving employers access to productive labor during the training period. Successful examples from other contexts, such as the U.S. Army-Carnegie Mellon partnership,<sup>14</sup> demonstrate the feasibility of intensive, targeted programs that rapidly develop job-ready capabilities.

Subsidy structures should be designed to incentivize desired behaviors. Higher subsidy rates could be offered for programs targeting nationals (supporting Emiratisation goals), programs in high-priority sectors identified in the National AI Strategy, programs serving workers from SMEs or underrepresented groups, and programs leading to portable, nationally recognized credentials. Subsidies should be contingent on program quality metrics and employment outcomes to ensure public investment generates value.

Beyond direct subsidies, the government can support employer investment through tax incentives for training expenditures, recognition programs highlighting leading employers in workforce development, and platforms facilitating employer collaboration on shared training needs. Industry consortia that pool resources for common training requirements can achieve economies of scale while reducing individual employer risk.

### Credential infrastructure and portability systems

Building on pilot initiatives like Skill Chain DX, the UAE should invest in comprehensive credential infrastructure that enables portable, verifiable skill recognition across employers and sectors. Such infrastructure addresses the coordination challenge whereby individual employers and training providers cannot independently create trusted credential systems, requiring collective action and government facilitation.

The credential infrastructure should incorporate several key features. First, interoperability standards enabling credentials from different issuers to be recognized and compared. Second, verification mechanisms, potentially using blockchain or other distributed ledger technologies, that prevent fraud while giving workers control over their credential data. Third, integration with the national skills framework to ensure credentials map to standardized competency definitions. Fourth, accessibility through user-friendly digital platforms that workers and employers can easily navigate.

The infrastructure should accommodate diverse credential types including traditional degrees, professional certifications, micro credentials, and employer-issued credentials. Rather than replacing existing credentials, the goal is to create a comprehensive ecosystem where all validated learning is recognized and portable. This approach supports the modular lifelong learning model emphasized in the literature.<sup>17</sup>

Quality assurance mechanisms are essential for maintaining credential value. The government should establish standards for credential issuers, potentially including accreditation requirements, regular audits, and public reporting of outcomes. Employers should be engaged in defining quality standards to ensure credentials signal capabilities they value.

### Bridging the two-track talent system

To prevent labor market bifurcation, the UAE must implement bridging programs that create pathways for mid-career workers to transition into AI-augmented roles and connect practitioner pipelines with specialist talent pathways. This requires moving beyond elite talent development to ensure inclusive access to reskilling opportunities.

Mid-career conversion programs should target workers in at-risk occupations or sectors, providing intensive training that enables transition to AI-complementary roles. These programs should combine technical skill development with career counseling, job placement support, and potentially income support during the transition period. Dawoud et al.'s,<sup>21</sup> finding that process-oriented skills represent the highest-leverage intervention for viable transitions suggests that programs should emphasize transferable capabilities applicable across multiple roles.

Bridging programs should also address the gap between foundational and advanced AI capabilities. Workers with basic digital literacy should have clear pathways to intermediate AI literacy and, for those with aptitude and interest, to advanced technical roles. This requires articulated program sequences where credentials stack toward larger qualifications and where prior learning is recognized to avoid redundant training.

Geographic equity deserves attention, ensuring that workers outside major urban centers have access to quality training. This may require investment in distributed delivery infrastructure, mobile training units, or incentives for training providers to serve underserved areas. Online delivery can partially address geographic barriers but must be complemented by in-person support and workplace application opportunities.

Targeted outreach to underrepresented groups—including women, older workers, and workers in traditional sectors—is essential for inclusive reskilling. These groups may face distinct barriers requiring tailored support, such as flexible scheduling for workers with caregiving responsibilities, confidence-building for workers anxious

about technology, or foundational skill development for workers with limited formal education.

### Aligning regulatory frameworks with workforce goals

The UAE should undertake comprehensive regulatory reform to align legal frameworks with workforce development objectives while protecting worker rights in AI-augmented workplaces. This requires action across multiple regulatory domains.

Employment law should be updated to address AI-related workplace changes, including establishing worker rights regarding algorithmic management, requiring transparency in AI-assisted employment decisions, providing recourse mechanisms when workers believe AI systems have treated them unfairly, and clarifying employer obligations for reskilling workers whose roles are substantially changed by AI adoption.

Data protection regulations should balance enabling AI development with protecting worker privacy. This includes clear rules about what workplace data can be collected and how it can be used, requirements for worker consent and notification, restrictions on sensitive inferences (e.g., about health or personal characteristics), and strong enforcement mechanisms with meaningful penalties for violations.

Credential regulation should establish quality standards for training providers and credential issuers, create accreditation processes ensuring programs meet minimum quality thresholds, require outcome reporting (placement rates, earnings impacts) for publicly funded programs, and protect consumers from fraudulent or low-quality credentials.

AI governance frameworks should address algorithmic accountability, bias prevention, and ethical AI deployment. This includes requiring impact assessments before deploying AI systems in high-stakes employment contexts, establishing standards for algorithmic fairness and transparency, creating oversight mechanisms with authority to investigate complaints, and promoting ethical AI development through guidelines and best practice sharing.

Importantly, regulatory development should be participatory, involving workers, employers, civil society, and technical experts. This ensures regulations are informed by diverse perspectives, practically implementable, and perceived as legitimate by affected stakeholders. Regular review and updating of regulations is essential given rapid technological change.

## Conclusion

The transformation of work through artificial intelligence presents both profound challenges and significant opportunities for the United Arab Emirates as it pursues its Vision 2031 goals of economic diversification and knowledge-based development. This article has examined reskilling strategies for AI-driven economies through the specific lens of the UAE context, synthesizing global best practices with analysis of the country's distinctive labor market characteristics, policy initiatives, and implementation challenges.

Several key findings emerge from this analysis. First, effective reskilling strategies share common elements across diverse contexts: skills-first hiring and AI-augmented apprenticeships that rebuild entry pathways; modular lifelong learning systems emphasizing both technical AI literacy and durable human skills; individualized learning pathways with transparent role evolution mapping; psychologically safe experimentation spaces; and policy mechanisms incentivizing credential portability and employer co-investment. These elements,

grounded in socio-technical systems theory, human capital theory, and role redesign frameworks, provide a foundation for workforce development in AI-augmented economies.

Second, the UAE has made substantial progress in establishing the institutional infrastructure for AI-driven workforce transformation. The National AI Strategy 2031, establishment of MBZUAI, appointment of dedicated AI leadership, and pilot initiatives like SkillChain DX demonstrate strategic commitment and resource mobilization. The reframing of Emiratisation around high-tech nationalization aligns workforce development with economic diversification goals, potentially creating more attractive private sector opportunities for nationals while advancing technological capabilities.

Third, significant challenges persist that require sustained policy attention. Skill gaps affecting 34% of workforce positions, the risk of a two-track talent system creating labor market bifurcation, organizational resistance to sustained training investment, regulatory gaps creating legal uncertainty, and ethical concerns generating workforce anxiety all impede effective reskilling implementation. These challenges are not unique to the UAE but are shaped by the country's specific context, including its small national population, high expatriate workforce participation, traditional public sector employment preferences, and rapid pace of technological adoption.

Fourth, addressing these challenges requires coordinated action across multiple policy domains and stakeholder groups. No single intervention—whether educational reform, employer incentives, or regulatory change—is sufficient. Rather, effective workforce transformation requires integrated strategies that align education, labor market policy, industrial policy, and social protection systems. The policy recommendations developed in Section 7—establishing a national skills framework, expanding co-investment models, building credential infrastructure, bridging the two-track talent system, and aligning regulatory frameworks—represent mutually reinforcing elements of such an integrated approach.

The UAE's substantial financial resources and proactive approach to digitalization provide significant advantages in navigating AI-driven workforce transformation. However, resources alone do not guarantee success. As socio-technical systems theory emphasizes, outcomes depend critically on institutional design, regulatory coherence, stakeholder coordination, and alignment of incentives. The UAE's experience demonstrates that even resource-rich nations face substantial challenges in translating AI investments into inclusive workforce development outcomes.

Several priorities emerge for future policy development and research. First, rigorous evaluation of existing reskilling programs is essential for identifying what works, for whom, and under what conditions. The UAE should invest in outcome-based assessment that tracks not just program completion but employment, earnings, and career progression of participants. This evidence should inform continuous program improvement and resource allocation.

Second, attention to equity and inclusion must be central to reskilling strategy. Without deliberate intervention, AI adoption risks exacerbating existing inequalities based on nationality, gender, age, sector, and geography. Ensuring that all workers—not just elite talent—have access to quality reskilling opportunities is both an economic imperative for maximizing human capital and a social imperative for inclusive development.

Third, the UAE should strengthen mechanisms for worker voice and participation in AI implementation and workforce development decisions. Workers possess valuable knowledge about how AI

can best augment their capabilities and what support they need for effective transitions. Participatory approaches that engage workers in role redesign, training program development, and policy formulation are more likely to generate effective, legitimate outcomes than top-down approaches.

Fourth, regional cooperation within the GCC could generate significant benefits through shared learning, coordinated standards, and economies of scale in training delivery. While each GCC country has distinctive characteristics, they face common challenges in AI adoption and workforce development. Collaborative initiatives could accelerate progress while reducing duplication.

Fifth, continued research is needed on several fronts: longitudinal studies tracking worker transitions and career trajectories in AI-augmented sectors; comparative analysis of different reskilling program models and their effectiveness; investigation of the distributional impacts of AI adoption across worker groups; examination of the interaction between Emiratisation policies and technology-focused workforce development; and analysis of regulatory approaches balancing innovation promotion with worker protection.

The UAE's journey toward an AI-enabled, knowledge-based economy is still in relatively early stages, with many uncertainties about how technological capabilities, labor market dynamics, and policy interventions will evolve. However, the country's strategic commitment, resource mobilization, and willingness to experiment with innovative approaches position it well to navigate this transformation. Success will require sustained effort, continuous learning and adaptation, coordination across multiple stakeholders, and unwavering focus on ensuring that technological progress translates into broadly shared prosperity and human development.

The broader implications of the UAE's experience extend beyond the country's borders. As a rapidly developing, resource-rich economy pursuing aggressive AI adoption, the UAE represents a test case for whether such nations can successfully navigate workforce transformation while maintaining social cohesion and advancing inclusive development. The strategies, challenges, and outcomes observed in the UAE context offer valuable lessons for other GCC countries, emerging economies pursuing technology-led development, and the global community grappling with AI's implications for work and workers. By examining the UAE's experience through rigorous analysis grounded in theoretical frameworks and empirical evidence, this article contributes to the growing body of knowledge informing policy and practice in AI-driven workforce transformation worldwide.

## Acknowledgements

None.

## Conflicts of interest

The author declares no conflicts of interest.

## Funding

None.

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