From Job Stability to Skill Agility: Redefining Youth Employability in the AI Era—A Systematic Literature Review

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Abstract. The rapid advancement of artificial intelligence (AI) technologies has fundamentally challenged traditional conceptualizations of youth employability. This systematic literature review synthesizes findings to examine the paradigm shift from "job stability" to "skill agility" in the context of AI-driven labor market transformation. The analysis reveals that AI exhibits a dual impact on youth employment: while automating routine cognitive tasks and displacing entry-level positions, it simultaneously creates new opportunities in AI-related fields and augments high-skill work. The review identifies three core dimensions of skill agility—skill awareness, learning velocity, and transferability—as essential competencies for young workers navigating this transition. The findings underscore the urgent need for educational reforms, policy interventions, and lifelong learning systems that prioritize human-AI cooperative skills.

Keywords: artificial intelligence, youth employability, job stability, skill agility, labor policy transformation

1 Introduction

With the release of ChatGPT triggering unprecedented disruption across global labor markets, generative AI systems demonstrate remarkable capabilities in performing complex knowledge work, including writing, analysis, programming, and creative tasks. The technological leap has profound implications for young workers who are simultaneously digital natives—possessing intuitive familiarity with technology—and labor market entrants facing the erosion of traditional entry-level pathways [14], [17].

Traditional employability frameworks have emphasized job stability as the cornerstone of career success, predicated on specialized expertise, organizational loyalty, and accumulated experience [25]. However, the accelerating pace of technological change has rendered this model increasingly obsolete. The half-life of technical skills has shortened dramatically, with the World Economic Forum [27] projecting that 39% of workers' core skills will need to change by 2030. In this context, "skill agility"—the capacity

Z. Ge et al. (eds.), *Proceedings of the 2026 6th International Conference on Education, Information Management and Service Science (EIMSS 2026)*, Atlantis Highlights in Computer Sciences 25,
https://doi.org/10.2991/978-94-6239-766-8_6

to rapidly identify, acquire, and apply new competencies in response to evolving demands—has emerged as the defining characteristic of employability in the AI era [7], [11].

This systematic literature review addresses the following research questions: (1) How does AI reshape the conceptual foundations of youth employability? (2) What empirical evidence exists regarding the impact of AI on youth employment outcomes? (3) What skills and competencies are most critical for young workers in AI-augmented workplaces? (4) What policy and educational responses are most effective in supporting youth transitions? By synthesizing recent scholarship across economics, education, and labor studies, this review aims to provide an integrated framework for understanding youth employability in the intelligent age and identifying critical research gaps for future investigation.

2 Theoretical Framework and Conceptual Evolution

2.1 From Human Capital to Dynamic Capability Theory

The theoretical foundations of employability have undergone significant revision in response to AI-driven labor market changes. Classical human capital theory [3] posited that education and training investments yield returns through enhanced productivity and earnings, assuming relatively stable skill demands over career lifespans. This framework underpinned decades of education policy and career guidance, emphasizing credential accumulation and specialization. However, the AI revolution has necessitated a shift toward dynamic capability theory [24], which emphasizes organizational and individual capacities to "integrate, build, and reconfigure internal and external competences to address rapidly changing environments." Recent scholarship has applied this framework to individual career development, conceptualizing skill agility as a meta-competency encompassing three interconnected dimensions [7], [23].

Skill awareness refers to the ability to recognize emerging skill requirements and assess one's own competency gaps in relation to technological change. This dimension is particularly critical for young workers who must navigate unprecedented uncertainty about which skills will remain valuable. It indicates that only 32% of young people can accurately assess their occupations' vulnerability to AI automation, highlighting significant awareness deficits. Learning velocity captures the speed and efficiency with which individuals can acquire new competencies. The compressed timelines of technological change demand rapid skill acquisition—what traditionally required months must now be accomplished in weeks. Transferability reflects the capacity to apply existing skills in novel contexts and combine diverse competencies to address emergent challenges. This dimension is increasingly important as occupational boundaries blur and hybrid roles proliferate. Industry 5.0 frameworks emphasize "human-centric" approaches that leverage uniquely human capabilities—creativity, emotional intelligence, ethical reasoning—alongside technical proficiency [11]. A conceptual review identifies data science, machine learning, natural language processing, robotics, and cybersecurity as increasingly indispensable skills, while routine manual and repetitive jobs face the highest automation risk [2].

2.2 AI Exposure and Occupational Vulnerability

A foundational work have refined exposure metrics to distinguish between automation, AI substituting human labor, and augmentation, AI complementing human capabilities [10]. Recent studies developed a comprehensive exposure taxonomy scoring occupations from 0 (without exposure) to 1 (full exposure), finding that high-skill white-collar positions—including financial analysts, legal professionals, and software developers—face unprecedented vulnerability [9]. While economy-wide employment continues to grow, young workers aged 22-25 in high-exposure occupations experienced a 6% employment decline from late 2022 to September 2025, compared to 6-9% growth for older workers [4]. *The task-based framework developed by Acemoglu and Restrepo shows that automation of existing tasks reduces labor demand and the labor share, whereas the creation of new tasks in which labor has a comparative advantage generates offsetting employment effects [1].*

The mechanism underlying this age disparity appears to be the nature of tasks typically assigned to early-career workers. Young employees are more likely to perform routine, structured tasks that are readily automatable—code documentation, basic analysis, data entry—while senior workers engage in complex problem-solving, client relationships, and strategic thinking that remain difficult to automate [26]. As AI systems increasingly handle routine cognitive work, the traditional apprenticeship model that enabled skill development through progressive responsibility is being disrupted.

3 Dual Impacts of AI on Youth Employment

3.1 The Displacement Effect: Erosion of Entry-Level Pathways

The displacement effects of AI on youth employment are becoming increasingly evident across multiple sectors. In the technology sector, which has historically attracted young talent with promises of high wages and rapid advancement, the picture has shifted dramatically. Software developers aged 22-25 experienced a 20% employment decline between late 2022 and July 2025, even as overall tech employment grew [4]. This paradox reflects the capacity of AI to automate precisely the tasks that constituted entry-level programming work—debugging, documentation, basic feature implementation.

Customer service represents another sector experiencing significant youth employment impacts. Entry-level customer service positions declined by nearly 11% from their November 2022 peak, with AI-powered chatbots and automated response systems handling an increasing share of routine inquiries [4]. The implications extend beyond immediate job losses, as customer service has traditionally provided young workers with crucial soft skills development opportunities—communication, problem-solving, conflict resolution—that transfer across careers.

The displacement dynamic is further complicated by firm-level responses to AI adoption. Research indicates that companies implementing AI prefer workforce adjustment through slowed hiring and natural attrition rather than mass layoffs [19]. While

this approach mitigates immediate unemployment spikes, it systematically disadvantages young labor market entrants who face reduced hiring opportunities while incumbent workers retain positions. The "experience trap" identified by engineering labor market researchers captures this dilemma: if AI assumes entry-level tasks, how do new graduates gain the experience necessary for career advancement? Early evidence based on observed AI exposure nevertheless indicates no systematic increase in unemployment among highly exposed workers since late 2022, while suggesting that hiring of younger workers has slowed in exposed occupations [15].

3.2 The Creation Effect: Emerging Opportunities in AI-Augmented Work.

Counterbalancing displacement effects, AI is generating substantial employment creation across multiple domains. While 92 million jobs will be displaced by 2030, 170 million new positions will be created, yielding a net increase of 78 million jobs [27]. Critically, many of these emerging roles are in AI-related fields where young workers' digital nativity provides a competitive advantage. AI and machine learning specialists rank among the fastest-growing occupations, with demand surging across industries seeking to implement and optimize intelligent systems [27]. These positions require technical competencies—programming, data analysis, model training—that align with young workers' educational backgrounds and learning agility. Furthermore, emerging roles such as AI trainers, prompt engineers, and AI ethicists represent entirely new occupational categories with limited competition from experienced workers who lack relevant expertise.

The augmentation potential of AI may ultimately exceed its automation impact. It finds that the augmentation potential of generative AI (14.6% of total employment) far exceeds its automation potential (2.2%), suggesting net positive employment effects [12]. Female employment shows particularly high augmentation potential at 22.7%, compared to 13.0% for males, indicating that AI may reduce certain gender disparities in labor market outcomes. Besides, in Kenya, one AI-powered food distribution platform has created youth employment in logistics optimization, data analysis, and quality control while supporting small-scale farmer productivity [16]. It illustrates that AI adoption can simultaneously transform existing jobs and create entirely new employment categories. Experimental evidence among highly skilled consultants shows that generative AI can improve performance by nearly 40% when tasks fall within its capability frontier, but can reduce performance when used beyond that frontier, underscoring the continuing need for expert judgment and output validation [22].

4 Policy Interventions and Educational Responses

4.1 Rethinking Labor Market Policy: From Protection to Preparation

Traditional labor market policies focused on employment protection—job security regulations, unemployment insurance, dismissal restrictions—are poorly suited to AI-driven labor market dynamics where job displacement occurs through hiring freezes

and skill obsolescence rather than mass layoffs. It argues for a paradigm shift toward "preparation policies" that emphasize continuous skill development and smooth labor market transitions [19]. The AI Training Funds proposed by the Century Foundation [6] aim to support both educator preparation and worker reskilling. Such funds could finance curriculum development, training delivery, and participant stipends to reduce financial barriers to skill acquisition. Furthermore, these proposals emphasize engaging employers early in technology adoption processes and creating formal roles for worker representatives in shaping AI implementation strategies.

The Commonwealth AI Compact offers a model for international cooperation, with three core commitments: (1) establishing a skills initiative targeting 1 million young people with tailored AI training over five years; (2) creating an innovation fund supporting youth-led AI startups; and (3) developing ethical AI principles ensuring technology enhances human dignity and opportunity [16]. This framework recognizes that the benefits from AI will be maximized through collaborative approaches rather than protectionist competition.

4.2 From Content Delivery to Skill Agility Development

Educational institutions face unprecedented pressure to adapt curricula and pedagogical approaches for the AI era. The traditional model of front-loaded education—intensive schooling followed by minimal ongoing learning—is fundamentally mismatched to labor markets where skill requirements evolve continuously. Global guidelines on AI in education emphasize the need for lifelong learning systems that enable continuous skill updating throughout careers [13]. A study of graduate students found significant age differences in generative-AI perceptions: younger students were more likely to regard the tools as essential for academic success, whereas older students often needed targeted training, peer mentorship, and tailored support [8].

The Skills-Future initiative from Singapore exemplifies successful educational transformation, offering AI literacy programs and lifelong learning opportunities that reached over 500,000 citizens by 2022 [13]. The program's focus on inclusion and adaptability ensures that individuals from diverse backgrounds can participate in AI-driven economic opportunities. Similarly, India's Skill India initiative has trained over 5 million people using AI-enhanced approaches, demonstrating how technology can simultaneously transform both training content and delivery methods. Cross-national youth programs reviewed in the literature suggest that AI empowerment is strengthened by combining practical skills training with equitable access, broad digital literacy, and ethical awareness [20].

Micro-credentialing and skills-based certification represent promising pathways for rapid, targeted skill acquisition. The Commonwealth of Learning's skills initiative demonstrates how short-form, focused training can quickly prepare youth for digital roles without requiring lengthy formal degrees [16]. Harambee Youth Employment Accelerator of South Africa has achieved over 75% sustainable employment rates among graduates of its DigiLink program, which specifically prepares youth for AI-adjacent digital jobs.

However, significant challenges remain [21]. Many educational institutions continue to ban AI tools due to concerns about plagiarism and misinformation [18], potentially disadvantaging students who miss opportunities to develop AI fluency. It demonstrates that workers using AI without proper training may actually perform worse than those working without AI assistance, highlighting the critical importance of effective AI education [5]. Policymakers must balance legitimate concerns about academic integrity with the imperative to prepare students for AI-augmented workplaces.

5 Conclusion and Research Gaps

This systematic literature review reveals a fundamental transformation in youth employability conceptualization and practice. The evidence overwhelmingly supports a paradigm shift from job stability—premised on specialized expertise in stable occupational structures—to skill agility—encompassing continuous learning, adaptability, and human-AI complementarity. The dual impacts of AI on youth employment are becoming increasingly clear: while displacing entry-level positions and eroding traditional career pathways, it simultaneously creates new opportunities in AI-related fields and augments high-skill work.

The review identifies five critical research gaps requiring scholarly attention:

- Longitudinal studies tracking young workers' career trajectories through AI-driven labor market transitions are urgently needed. Current evidence primarily captures short-term employment effects; the long-term implications of delayed entry into professional careers remain poorly understood.
- Comparative research across national contexts and institutional frameworks would illuminate how different policy approaches—vocational training systems, social safety nets, labor market regulations—shape youth employment outcomes in the AI era.
- The measurement of skill agility requires significant refinement. While conceptual frameworks are well-developed, validated instruments for assessing skill awareness, learning velocity, and transferability remain limited. Such measures would enable more precise evaluation of educational interventions and career guidance approaches.
- The ethical dimensions of AI in youth employment—including algorithmic bias in hiring, surveillance of young workers, and the psychological impacts of career uncertainty—warrant deeper investigation.
- Future research must move beyond descriptive analysis toward prescriptive guidance. While the challenges are increasingly well-documented, evidence on effective interventions—specific educational practices, policy mechanisms, organizational strategies—remains limited. As AI capabilities continue advancing at unprecedented rates, the window for proactive intervention narrows. The research community must prioritize actionable knowledge that can inform immediate decisions by educators, policymakers, and young people themselves.

The transformation from job stability to skill agility represents both a challenge and an opportunity for young workers. Those who develop the meta-competencies to navigate continuous change, leverage the augmentation potential of AI, and cultivate uniquely human capabilities will be best positioned to thrive in the intelligent age. Realizing this potential, however, requires concerted action across education, policy, and organizational domains to ensure that the benefits from AI are broadly shared and its disruptions humanely managed.

References

1. D. Acemoglu and P. Restrepo, "The race between man and machine: Implications of technology for growth, factor shares, and employment," American Economic Review, vol. 108, no. 6, pp. 1488-1542, 2018.
2. C. Boonngam, E. Vorasiha, W. Khlungsaeng, and J. Boonying, "Labor market changes in the era of AI," in International Conference on Management, Innovation, Economics and Social Sciences, vol. 1, no. 1, pp. 572-575, 2025.
3. G. Bottone and V. Sena, "Human capital: Theoretical and empirical insights," American Journal of Economics and Sociology, vol. 70, no. 2, pp. 401-423, 2011.
4. E. Brynjolfsson, B. Chandar, and R. Chen, "Canaries in the coal mine?: Six facts about the recent employment effects of artificial intelligence," unpublished, 2025.
5. F. Candelon, L. Krayer, S. Rajendran, and D. Z. Martinez, "How people can create–and destroy–value with generative AI," Boston Consulting Group, 2023.
6. Century Foundation, "Labor market disruption and policy readiness in the AI era," 2025.
7. C. Challoumis, "The imperative of skill development in an AI revolution," in XIX International Scientific Conference, London, Great Britain, pp. 132-168, 2024.
8. C. Cho and D. Ofosu-Anim, "Navigating the technology divide: The role of educational leadership in generative AI usage among diverse age groups," Open Journal of Leadership, vol. 13, no. 4, pp. 515-531, 2024.
9. T. Eloundou, S. Manning, P. Mishkin, and D. Rock, "GPTs are GPTs: Labor market impact potential of LLMs," Science, vol. 384, no. 6702, pp. 1306-1308, 2024.
10. C. B. Frey and M. A. Osborne, "The future of employment: How susceptible are jobs to computerisation?," Technological Forecasting and Social Change, vol. 114, pp. 254-280, 2017.
11. L. Gamberini and P. Pluchino, "Industry 5.0: A comprehensive insight into the future of work, social sustainability, sustainable development, and career," Australian Journal of Career Development, vol. 33, no. 1, pp. 5-14, 2024.
12. International Labour Organization, "Employment and social trends 2026," ILO Publications, 2025.
13. Y. Li, L. Tolosa, F. Rivas-Echeverria, and R. Marquez, "Integrating AI in chemical education: Navigating UNESCO global guidelines, emerging trends, and its intersection with sustainable development goals," UNESCO Education Sector, 2025.
14. M. R. Mancaniello and F. Lavanga, "Adolescence in the Italian labour market: In search of an equilibrium among instability, uncertainty, and AI challenges," Social Sciences, vol. 13, no. 12, p. 688, 2024.
15. M. Massenkoff and P. McCrory, "Labor market impacts of AI: A new measure and early evidence," Anthropic Research, vol. 5, 2026.
16. D. McGarry, "AI, youth, and the future of work: Unlocking opportunities in the Commonwealth," Commonwealth Enterprise and Investment Council, 2025.

17. T. Mukherjee, "Youth transition in the digital age: Balancing digital competency demands and preparing for the future," in Handbook of Youth Development: Policies and Perspectives from India and Beyond, Singapore: Springer Nature Singapore, pp. 359-372, 2023.
18. B. Nolan, "Here are the schools and colleges that have banned the use of ChatGPT over plagiarism and misinformation fears," Business Insider, vol. 30, 2023.
19. OECD, "OECD Employment Outlook 2023: Artificial intelligence and the labour market," OECD Publishing, 2023.
20. A. Rani, "Artificial intelligence: Redefining culture and empowering youth," Asian Journal of Technology & Management Research, vol. 14, no. 02, pp. 2249-0892, 2025.
21. D. Sharma, "Beyond employability: Re-examining the purpose of education in preparing young people for an uncertain future," International Journal of Social Sciences, Language and Linguistics, vol. 6, no. 01, pp. 88-98, 2026.
22. M. Somers and M. I. T. Sloan, "How generative AI can boost highly skilled workers' productivity," MIT Sloan Management Review, 2023.
23. P. Tadas and S. Agarmore, "Redefining work in the age of AI: Challenges and pathways to opportunities," in 2024 IEEE International Conference on Signal Processing, Informatics, Communication and Energy Systems (SPICES), IEEE, pp. 1-5, 2024.
24. D. J. Teece, G. Pisano, and A. Shuen, "Dynamic capabilities and strategic management," Strategic Management Journal, vol. 18, no. 7, pp. 509-533, 1997.
25. H. Tushar and N. Sooraksa, "Global employability skills in the 21st century workplace: A semi-systematic literature review," Heliyon, vol. 9, no. 11, 2023.
26. M. Wesebaum and F. Valeria, "Curse or blessing of AI for youth employment," European Student Think Tank, 2024.
27. World Economic Forum, "Future of jobs report 2025," World Economic Forum Publications, 2025.