IIP International Multidisciplinary Research Journal
IIPIMRJ

An Online Peer-Reviewed / Refereed Journal

Vol: 03 No. Issue I, (January-March) (2026)
Impact Factor: GSRD-IF: 5.001
ISSN: 3049-2734 (Online)

DIGITAL LITERACY AND ARTIFICIAL INTELLIGENCE AS DETERMINANTS OF YOUTH EMPLOYMENT OUTCOMES IN INDIA: A COMPREHENSIVE ANALYSIS OF THE 2024-2025 LABOR MARKET TRANSITION

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Article Info

Article History:
Received: 31st Dec 2025
Accepted: 15th Jan 2026
Published: 22nd Jan 2026

Keywords:

Digital Literacy; Artificial Intelligence; Youth Employment; Skill Gap; Indian Labor Market

ABSTRACT

This study examines the role of digital literacy and artificial intelligence (AI) as key determinants shaping youth employment outcomes in India during the 2024–2025 labor market transition. As India experiences a demographic advantage with a large youth population, the sustainability of this demographic dividend increasingly depends on the capacity of young people to acquire and apply digital and AI-related skills. Drawing on secondary data from national labor surveys, education reports, and industry studies, the research analyzes how disparities in digital literacy and AI proficiency influence employability, sectoral mobility, and job quality among youth aged 15–29. The findings reveal that while youth unemployment in India has declined in recent years, employment opportunities are becoming more skill-selective and technology-intensive. Digital literacy has emerged as a baseline requirement for entry into formal employment, while AI fluency is rapidly redefining expectations even for entry-level roles. However, significant inequalities persist across rural–urban locations, gender, and socio-economic backgrounds, limiting equitable access to technology-driven jobs. The study also highlights a paradox wherein high enterprise-level AI adoption coexists with low preparedness among fresh graduates, exposing youth to risks of job displacement, underemployment, and psychological stress. By synthesizing economic, technological, and sociological perspectives, this research underscores that digital literacy and AI capabilities are no longer supplementary skills but structural prerequisites for youth employment resilience. The study contributes to policy and academic discourse by emphasizing the need for integrated educational reforms, targeted digital skilling initiatives, and inclusive AI strategies to ensure that technological transformation translates into broad-based and sustainable employment outcomes for Indian youth.

How to Cite: Jadhav, A. G. (2026). DIGITAL LITERACY AND ARTIFICIAL INTELLIGENCE AS DETERMINANTS OF YOUTH EMPLOYMENT OUTCOMES IN INDIA: A COMPREHENSIVE ANALYSIS OF THE 2024–2025 LABOR MARKET TRANSITION. *IIP: International Multidisciplinary Research Journal (IIPIMRJ)*, 3(1), 88–93.

Introduction

India's contemporary labour market is shaped by two powerful and interrelated forces: a large and youthful population and rapid technological change. Individuals between the ages of 15 and 29 account for nearly one-fourth of the country's total population, giving India a demographic advantage that many developed nations no longer possess. However, this advantage is not automatic. It can translate into economic growth only if young people are meaningfully integrated into productive employment. In this context, digital literacy and artificial intelligence (AI) have emerged as decisive factors influencing who gains access to opportunities and who is left behind.

Digital literacy has moved beyond basic computer use to become a foundational requirement for participation in the modern economy. Tasks such as online communication, information evaluation, digital safety, and basic content creation are now embedded in everyday work practices across sectors. At the same time, AI and generative AI tools are rapidly transforming how work is organized, especially in information technology (IT), business process management (BPM), finance, healthcare, and platform-based services. For Indian youth, employability increasingly depends not only on formal education but also on their ability to work alongside digital systems and AI-enabled tools.

Although recent labour statistics indicate a decline in overall youth unemployment, this improvement masks deeper structural challenges. Employers frequently report a persistent skill gap, with a significant proportion of young job seekers lacking job-ready digital and AI-related competencies. This paper situates youth employment within this changing technological landscape and examines how disparities in digital literacy and AI exposure shape employment outcomes in India during the 2024–2025 period.

Research Problem and Significance

Despite widespread access to mobile phones and the internet, a clear divide remains between access to technology and the ability to use it productively for employment. General literacy levels in India have crossed 80 percent, yet household-level digital literacy remains far lower. This gap raises important questions about the adequacy of existing education and training systems in preparing youth for a digital-first economy. The problem is particularly acute for rural youth and young women, who face additional social and infrastructural constraints.

The significance of this issue extends beyond employment statistics. As India aspires to become a five-trillion-dollar economy and achieve the vision of a developed nation by 2047, unequal access to digital and AI skills risks creating a segmented labour market. On one side may emerge a digitally fluent workforce concentrated in high-paying, secure jobs, while on the other side a large group of digitally excluded youth may remain confined to informal, low-wage, or unstable work. Moreover, rapid technological change has psychological implications, including anxiety, insecurity, and stress among young workers who fear job displacement due to automation.

By analysing the relationship between digital literacy, AI adoption, and youth employment, this paper seeks to contribute to a more nuanced understanding of labour market transitions in India and to inform policy, education, and workforce development strategies.

Objectives of the Study

The study is guided by the following objectives:

1. To examine current levels of digital literacy and AI exposure among Indian youth across regions and demographic groups.
2. To analyse the relationship between digital literacy and employment outcomes in formal and informal sectors.
3. To understand how AI is reshaping entry-level roles and skill requirements.
4. To assess the effectiveness of existing policy initiatives aimed at reducing digital skill gaps.

Review of Literature

Scholarly frameworks increasingly define digital literacy as a multidimensional competence that includes technical skills, critical thinking, communication abilities, and digital safety awareness. International models such as UNESCO's Digital Literacy Global Framework and the European Union's DigComp framework emphasize problem-solving and responsible technology use. Indian scholars further distinguish between basic literacy and functional digital literacy, highlighting the ability to evaluate information and apply digital tools in real-life contexts.

Empirical studies indicate that while smartphone access has expanded rapidly, especially in rural areas, meaningful use for education and employment remains uneven. Many young users demonstrate confidence in entertainment-oriented tasks but struggle with security-related or productivity-oriented digital practices. This uneven skill profile limits their transition from digital consumption to digital employment.

AI is widely recognized as a general-purpose technology with the capacity to transform production systems and labour processes. Rather than simply replacing workers, AI tends to reorganize tasks, augmenting some roles while eliminating others. Global research suggests that non-routine cognitive tasks are particularly exposed to AI-driven change, making white-collar and service-sector jobs vulnerable as well as dynamic.

In India, enterprise-level AI adoption has accelerated, particularly in sectors such as banking, healthcare, retail, and automotive manufacturing. However, the rise of autonomous and agent-based AI systems has begun to compress organizational hierarchies, reducing the number of routine entry-level roles that traditionally served as gateways for young graduates. This shift has important implications for early-career employment.

India's labour market has shown signs of recovery following the pandemic, with improvements in labour force participation and worker population ratios. Nonetheless, youth unemployment remains a structural concern, especially in urban areas and among educated youth. Gender disparities persist, with young women experiencing higher unemployment rates in cities despite comparable or higher educational attainment.

A recurring theme in the literature is the mismatch between education outcomes and labour market requirements. Large-scale skilling initiatives have expanded training coverage, but rapid technological change often outpaces curriculum updates, limiting their effectiveness.

Methodology

This study adopts a mixed-methods research design based on secondary data analysis. Quantitative data are drawn from national labour surveys, education assessments, and industry reports, while qualitative insights are derived from academic studies and expert analyses on technology adoption and workforce

psychology. This approach allows for a comprehensive examination of employment trends alongside lived experiences of young workers.

Ethical considerations are addressed through the use of anonymized and publicly available datasets, ensuring that interpretations remain sensitive to the socio-economic realities of marginalized groups.

Results and Analysis

Digital Literacy Levels Among Indian Youth

National data indicate a substantial rise in digital literacy over the past decade, yet this progress is unevenly distributed. Urban youth demonstrate significantly higher digital literacy rates than their rural counterparts, and regional disparities remain pronounced. The following table presents digital literacy rates across selected regions and demographic segments.

Table 1: Digital Literacy Rates by Region (2023–24)

Regional/Demographic Segment	Digital Literacy Rate (%)	Source
National Average	46.3	4
Urban India	70.5	4
Rural India	33.1	4
Southern India	60.2	4
Northeastern India	35.4	4

While access to devices is widespread, ownership and independent use remain limited, particularly for rural youth and young women. This constraint directly affects opportunities to practice and develop advanced digital skills.

Functional Digital Skills

Evidence from school-age populations highlights a functional literacy gap. Youth perform well in basic tasks such as searching for videos or sharing content, but struggle with digital safety and privacy-related activities. These gaps have direct implications for employability, as modern workplaces require secure and responsible technology use.

Table 2: Digital Task Performance among Rural Youth (Ages 14–16)

Digital Task	Male (%)	Female (%)	All (%)	Source
Set an alarm	81.5	72.4	77.2	23
Browse for information	80.1	78.6	79.3	23
Find a YouTube video	88.4	85.7	87.3	23
Share a YouTube video	93.6	90.5	92.4	23
Block or report a profile	65.2	58.7	62.3	23
Make profile private	60.3	50.2	55.0	23
Change a password	65.4	50.1	58.0	23

AI Awareness and Adoption

India presents a paradox in AI adoption. Enterprises report high levels of AI integration, yet entry-level employees show relatively low professional use of AI tools. Many young workers express anxiety about automation, perceiving AI as a threat rather than an opportunity. This perception gap reflects limited exposure to structured AI training and uncertainty about future career pathways.

Barriers to AI adoption among youth include limited access to advanced computing infrastructure, linguistic bias in AI systems, and inadequate institutional preparedness. These factors collectively constrain the ability of young people to benefit from AI-driven productivity gains.

Impact on Employment Outcomes

Digital literacy shows a strong positive correlation with formal employment. Youth with digital skills are more likely to secure jobs in IT-enabled services, finance, and e-commerce, while those without such skills remain concentrated in manual or low-productivity sectors. Employers increasingly view basic AI familiarity as an implicit requirement, with expectations evolving toward more advanced forms of human–AI collaboration.

Table 3: Sectoral Impact of AI on Employment and Productivity

Sector	Productivity Boost by 2030	Primary Mechanism	Source
Services (IT/BPM)	2.61%	Task automation and augmentation	39
Manufacturing	Low/Moderate	Resource optimization	39
Construction	Low/Moderate	Capital deployment	39
BFSI/Healthcare	High	Decision-support AI	27

Discussion

The findings point to a pattern of disruptive but uneven growth. Declining unemployment rates coexist with shrinking entry-level opportunities in AI-exposed sectors, suggesting that experienced workers benefit more from AI augmentation than new entrants. This dynamic risks excluding young job seekers from career ladders that previously allowed gradual skill development.

At the same time, evidence from digital payment adoption in rural areas demonstrates that technology uptake can advance rapidly when it offers immediate economic value. Such examples indicate that practical utility, rather than abstract skill training alone, can be a powerful driver of digital inclusion.

Implications for Education and Policy

The study highlights the need to integrate AI and digital competencies into mainstream education rather than treating them as optional add-ons. Teacher training, curriculum reform, and context-sensitive digital programs are essential to bridge existing gaps. Policies should prioritize functional digital skills and promote equitable access to AI tools in local languages.

Conclusion

Digital literacy and AI have become central determinants of youth employment quality in India. While overall employment indicators show improvement, deep inequalities persist across regions, gender, and skill levels. Addressing these challenges requires coordinated efforts across education, industry, and policy domains to ensure that technological transformation leads to inclusive and sustainable employment for India's youth.

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