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Digital literacy and skill enhancement for Haryana's workforce in the age of the digital economy

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***Abstract*---**As digital transformation reshapes global labor markets, digital literacy has emerged as a critical determinant of employability, economic mobility, and inclusive development. This study investigates the state of digital literacy and skill enhancement in Haryana, India—a state marked by rapid economic growth but deep urban-rural and socio-economic disparities in digital access. Using a qualitative document analysis of secondary data from government reports, policy documents, and national program evaluations (including PMKVY, NSDC, and Digital India), the research explores the effectiveness of digital skill development initiatives and identifies structural barriers impeding their success. The study is framed through Human Capital Theory and the Capability Approach to position digital literacy as both an economic asset and a catalyst for individual agency. Findings reveal that while urban areas in Haryana have made progress in digital adoption, rural regions remain underserved due to poor infrastructure, gender-based exclusion, and limited alignment between training programs and the evolving digital job market. The research underscores the need for localized, inclusive, and sector-specific digital training interventions, supported by public-private partnerships and infrastructure investments. The study contributes to theoretical discourses on digital inclusion and workforce development and offers actionable policy recommendations for bridging the digital divide in emerging economies.

***Keywords*---**digital literacy, skill development, human capital, rural-urban divide, Haryana, workforce readiness, public policy.

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Background:
As the global economy increasingly pivots towards digital technologies, digital literacy has become a fundamental skill for workforce participation (Helsper, 2020). Various studies have highlighted the importance of digital literacy as a foundation for the success of the modern workforce (OECD, 2021). Digital literacy, which includes the ability to use digital devices, tools, and platforms efficiently, is essential for individuals to participate in the digital economy.

In India, studies show a significant gap in digital literacy, particularly in rural areas, which affects employability and economic mobility (Mishra & Tripathi, 2020). According to a report by the Ministry of Skill Development and Entrepreneurship (MSDE), the lack of digital skills is a significant barrier to employability in India, especially in rural and semi-urban areas (MSDE, 2020). This gap is evident in states like Haryana, where rural and marginalized populations often lack access to digital resources and training opportunities, hindering their readiness for the evolving job market (Goswami, 2021).

Haryana, as one of the rapidly developing states in India, is undergoing significant transformations in its workforce, with increasing emphasis on digital technologies across industries. However, despite the state's progress in digital infrastructure and education, there is still a gap in digital literacy and skills among a large section of the population, especially in rural areas and among marginalized communities. The rise of the digital economy requires a workforce that is not only digitally literate but also skilled in contemporary digital tools, platforms, and technologies. Hence, understanding the current state of digital literacy and skill development programs in Haryana is crucial for formulating strategies that can bridge this gap and ensure that the workforce is prepared for emerging job opportunities in the digital age.

Skill development programs have been integral in addressing this issue. Skill development initiatives in India, such as the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and National Skill Development Mission (NSDM), aim to train individuals in industry-relevant skills, but digital skills often remain underemphasized (National Skill Development Corporation, 2021). Initiatives like the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) have been successful in some regions, but their impact on digital literacy and future-readiness remains underexplored in Haryana (Patel & Luthra, 2021). A key challenge is the mismatch between the skills imparted by these programs and the rapidly changing demands of the digital economy, including skills in AI, data analysis, and cloud computing (Chaudhuri & Singh, 2022).

Furthermore, various studies highlight the regional digital divide in India, where states with robust digital infrastructures, such as Maharashtra and Karnataka, outperform others in workforce readiness (Bansal & Agarwal, 2021). Research has shown that states with stronger educational infrastructures (e.g., Punjab, Maharashtra, Karnataka) perform better in terms of digital literacy than states with less developed educational systems (World Bank, 2021). In Haryana, the digital divide exists not only between rural and urban areas but also among different socio-economic groups (Rural Development Ministry, 2022). This divide can significantly impact access to opportunities in the digital workforce.

Thus, for Haryana to remain competitive, targeted policy interventions and partnerships between the government, industry, and educational institutions are essential to enhance digital literacy and equip workers with industry-relevant skills (Sharma & Jha, 2023). The World Economic Forum (2020) reports that skills such as artificial intelligence, data analysis, and digital communication will dominate the job market in the future. Therefore, developing digital skills is crucial for preparing the workforce to meet these emerging demands.

Theoretical Framework

This study draws on Human Capital Theory and the Capability Approach to explore the relationship between digital literacy, skill enhancement, and economic outcomes for Haryana's workforce. Human Capital Theory (Becker, 1964) posits investments in education and skills development lead to higher productivity and better economic outcomes. In the context of digital literacy, acquiring digital skills can be viewed as an investment in human capital that enhances employability and income potential in the digital economy. This theory helps explain how skill development programs aimed at improving digital literacy can boost the workforce's productivity and participation in the growing digital job market.

The Capability Approach (Sen, 1999) complements this by focusing on individuals' ability to achieve valuable functioning (e.g., stable employment, economic independence) through the expansion of their capabilities. Digital literacy is seen as a key enabler of these capabilities, especially for marginalized communities in rural Haryana, who may lack access to opportunities without digital skills (Robeys, 2005). Both frameworks highlight the importance of digital literacy in empowering workers to thrive in a rapidly changing economy.

Next, the study outlines the specific research questions and objectives that the study aims to address, such as the current state of digital literacy in Haryana, barriers to digital skill acquisition, and the role of current skill development programs.

Research Questions:

1. What is the current level of digital literacy among the workforce in Haryana, particularly in rural and urban areas?
2. How effective are current skill development programs in Haryana in fostering digital literacy and preparing the workforce for the digital economy?
3. What are the barriers to digital literacy and skill development in Haryana, especially in rural areas and marginalized communities?
4. What are the key skills required by the new-age workforce in Haryana to succeed in the digital economy?
5. How can government, industry, and educational institutions collaborate to improve digital literacy and skill development in Haryana?

Research Objectives:

1. Assess the current state of digital literacy among Haryana's workforce, focusing on disparities between rural and urban areas, as well as variations across different socio-economic groups.

2. Evaluate the effectiveness of existing skill development programs in Haryana, such as PMKVY and local digital literacy initiatives, in improving employability and preparing workers for the digital economy.
3. Identify key barriers to digital literacy in Haryana, including infrastructural challenges, socio-economic constraints, and limitations in the availability of training resources, particularly in rural areas.

Materials and Methods

Also, secondary data from government reports, including Haryana's Skill Development Policy, the PMKVY program evaluation reports, and digital literacy surveys from organizations like the National Skill Development Corporation (NSDC) and Digital India, is analysed (Sharma & Jha, 2023). These sources provide insights into existing skill development programs and barriers faced by the workforce. This study employs qualitative analysis as the primary research methodology to assess the state of digital literacy and skill development for Haryana's workforce. Thematic analysis is particularly useful for extracting information from existing reports, government publications, and program evaluations, enabling the researcher to identify patterns, gaps, and trends in digital skill development initiatives.

Secondary Data collection and Analysis

In the context of digital literacy and skill development in Haryana, key government reports and program evaluations provide crucial insights into the effectiveness of initiatives like the Pradhan Mantri Kaushal Vikas Yojana (PMKVY), Haryana's Skill Development Policy, and broader national initiatives such as Digital India. Authors conducted the document analysis of the secondary data to evaluate the current landscape and identify gaps and opportunities for improvement.

Haryana's Skill Development Policy

Haryana's Skill Development Policy (2016) outlines the state's commitment to enhancing employability through skill-based training, with a specific focus on the digital economy. The policy emphasizes the development of digital skills among youth, recognizing the need for a skilled workforce to participate in the global digital economy. It sets ambitious targets, aiming to train millions of youths in sectors such as IT, e-commerce, and digital marketing. However, despite these targets, the policy's implementation has faced challenges in rural areas, where infrastructural gaps and a lack of awareness hinder participation (Sharma & Jha, 2023). Furthermore, while the policy emphasizes digital skills, it does not provide detailed frameworks for addressing the disparities in access to technology and training resources across socio-economic groups.

National Sample Survey Office (NSSO) Report on Digital Literacy (2019)

The NSSO Report on Digital Literacy (2019) provides a national-level survey on the status of digital literacy across India, including detailed data on Haryana. The report found that while urban areas in Haryana have seen relatively high levels of digital penetration, rural areas still face substantial gaps in digital literacy. Specifically, only 27% of rural households in Haryana have access to the internet, compared to 68% of urban households.

Moreover, the report found that digital literacy programs, while growing, have not yet reached a large portion of the marginalized and older populations. It suggests that digital literacy training should focus on women, senior citizens, and low-income households who remain the most digitally excluded groups in Haryana (NSSO, 2019). There is also a notable gender gap, with women in rural Haryana significantly less likely to have digital skills compared to their male counterparts.

PMKVY Program Evaluation

The PMKVY (Pradhan Mantri Kaushal Vikas Yojana) is one of India's flagship skill development programs aimed at providing youth with industry-relevant skills. The PMKVY program has been evaluated multiple times, with the most recent reports indicating mixed results. According to the PMKVY 3.0 Evaluation Report (2021), the program has been successful in scaling up training efforts, especially in urban areas, but its reach and effectiveness in rural areas remain limited. Training centers are often concentrated in urban hubs, leaving rural populations with limited access to digital training. Additionally, while the program offers certification in various skills, there is a growing concern about the quality of training and alignment with the digital job market's evolving demands (Patel & Luthra, 2021). The PMKVY's focus on basic digital literacy does not always cater to emerging skills such as data analytics, machine learning, or e-commerce, which are essential for future employment in the digital economy.

UNDP India Report on Digital Transformation and Employment (2021)

The United Nations Development Programme (UNDP) India Report on Digital Transformation and Employment (2021) highlights the transformative role of digital literacy in improving employment prospects and bridging social and economic inequalities. It emphasizes that Haryana, being an agricultural state, can greatly benefit from digital inclusion in rural areas, especially in sectors like agriculture technology, digital marketing for farm produce, and online retail platforms. The report advocates for a sectoral approach to digital skill training, where workers are trained according to the specific needs of the local economy, rather than offering generic courses. This approach would require collaboration between the government, private sector, and training providers to develop targeted digital curricula that enhance job-readiness in the digital economy (UNDP, 2021).

Digital India and NSDC Reports

The Digital India initiative, launched in 2015, aims to increase digital literacy and access across India. According to the National Skill Development Corporation (NSDC) report (2020), the initiative has contributed significantly to improving digital access through initiatives like the Common Services Centres (CSCs) and Skill Development Centres. These centers provide both training and digital infrastructure in rural areas. However, NSDC's 2021 Annual Report highlights the challenges faced in integrating digital skills training with local economies, as workers in rural areas often lack continuous internet access and exposure to digital devices. Further, the Digital Literacy for Rural India Report (2022) from the Digital India Programme identifies gaps in digital literacy in Haryana, especially in districts with low literacy rates. It suggests that while basic digital skills are being imparted, more advanced digital training programs are needed to match the demands of the digital economy. According to the report, these programs need to be more localized and tailored to the needs of different socio-economic groups.

The NSDC's Digital Literacy Report (2021) provides a detailed assessment of the progress made under national digital literacy schemes, including Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA), National Digital Literacy Mission (NDLM), and PMKVY. According to the report, Haryana has shown significant improvements in digital literacy across urban and rural regions, but it also faces persistent challenges in ensuring equitable access to digital training. The report emphasizes that rural Haryana lags urban regions in digital adoption, with internet penetration remaining low in several areas. Additionally, many rural workers still lack the necessary skills to navigate essential digital tools such as e-commerce platforms, digital payments, and online learning resources. The NSDC suggests that training programs should focus more on practical applications of digital tools that align with local employment opportunities, especially in agriculture, healthcare, and small business development (NSDC, 2021).

Haryana Skill Development Mission Annual Report (2022)
The Haryana Skill Development Mission (HSDM) plays a pivotal role in implementing skill training initiatives in the state. The 2022 Annual Report of HSDM highlights the progress made in digital literacy, particularly in providing vocational training and digital skill courses through various skill development centers across the state. According to the report, over 200,000 individuals were trained in different digital literacy programs in 2022, including basic digital skills, online banking, e-commerce, and IT-enabled services. However, the report also identifies key challenges, particularly in rural areas where access to digital infrastructure remains a major barrier. In villages and towns, internet connectivity issues, lack of electricity, and inadequate access to digital devices hinder effective delivery of training. The report emphasizes the need for improved infrastructure, especially in remote districts, to ensure better outcomes from skill development programs. Moreover, it highlights that women and marginalized communities in rural Haryana are underrepresented in digital literacy programs, suggesting a need for targeted outreach and awareness campaigns (Haryana Skill Development Mission, 2022).

Digital India Annual Report (2022)
The Digital India Programme, launched by the Government of India, aims to enhance digital literacy and promote digital inclusion. The 2022 Digital India Annual Report highlights progress in creating a digitally empowered society, with significant strides made in expanding broadband connectivity, mobile internet access, and digital training initiatives in rural and semi-urban regions. Under this initiative, Common Service Centres (CSCs) in Haryana have been critical in providing digital training and government services to underserved populations.
The report underscores that despite improvements in infrastructure, digital literacy in rural areas remains far behind urban regions. The lack of digitally skilled trainers, localized content, and support for women and older workers are key barriers. The report also points to the importance of multi-channel training delivery (including mobile apps, offline content, and local trainers) to increase the reach and impact of digital literacy programs (Ministry of Electronics & Information Technology, 2022).

Results and Discussion

The focus of the qualitative analysis is to evaluate the current level of digital literacy, assess the effectiveness of existing skill development programs, identify barriers to digital literacy, and propose strategies to enhance skill development for Haryana's workforce, particularly in the context of the evolving digital economy.

Current Level of Digital Literacy in Haryana: Data from the National Sample Survey Office (NSSO) 2019 report reveals that while urban areas in Haryana have relatively higher digital literacy levels, rural areas lag significantly behind. Approximately 68% of urban households in Haryana reported internet access, compared to just 27% of rural households (NSSO, 2019). This gap is further reflected in digital literacy rates, where only 33% of rural residents have basic digital skills compared to 70% in urban regions. These disparities are largely due to infrastructural challenges such as unreliable internet access, lack of digital devices, and limited exposure to digital technologies in rural areas (Sharma & Jha, 2023). This data highlights the urgent need for targeted interventions to bridge the urban-rural digital divide.

Effectiveness of Existing Skill Development Programs: The PMKVY program evaluation report (2021) highlights that Haryana has made notable progress in scaling up vocational training initiatives, but the program's impact on digital skill development remains uneven. In urban centers like Gurugram and Faridabad, the program has successfully increased the digital literacy of the workforce, enabling workers to access new job opportunities in sectors like IT-enabled services, e-commerce, and digital marketing. However, in rural areas, the report indicates that access to training centers and digital devices remains limited. According to the NSDC's 2021 report, rural populations face barriers such as lack of trainers, poor internet connectivity, and low levels of digital awareness (NSDC, 2021). Additionally, while the program has trained hundreds of thousands of youth in basic digital skills, there remains a significant gap in more advanced skills such as data analytics, artificial intelligence (AI), and blockchain, which are crucial for emerging digital economies.

Furthermore, the Haryana Skill Development Mission Annual Report (2022) notes that while over 200,000 people have been trained in digital skills, most of these efforts have focused on basic competencies such as email use, online banking, and social media platforms. The report calls for more focus on industry-specific digital skills such as software development, e-commerce operations, and cybersecurity, to meet the demands of the digital economy (Haryana Skill Development Mission, 2022).

Major Barriers to Digital Literacy in Haryana: Several reports have pointed to key barriers preventing widespread adoption of digital literacy programs in Haryana. The NSDC (2021) identifies infrastructure limitations, particularly in rural areas, as one of the main obstacles to effective digital skills training. For instance, poor internet connectivity and lack of digital devices prevent many workers from accessing online learning platforms or participating in digital literacy programs. The Haryana Skill Development Policy (2016) further notes that rural residents often face socio-economic constraints, such as the inability to afford smartphones

or computers, which impedes their ability to learn digital skills independently (Haryana Skill Development Policy, 2016).

Another significant barrier highlighted in the Digital India Annual Report (2022) is the gender divide in digital literacy. In rural Haryana, women's access to digital skills is limited due to cultural factors, lack of awareness, and lower levels of education compared to men (Ministry of Electronics & Information Technology, 2022). The NSDC Digital Literacy Report (2021) also reports that older workers and those from low-income backgrounds face difficulty in participating in training programs, primarily due to financial constraints and lack of support systems for digital adoption at home.

Key Digital Skills Required for the Workforce: The evolving nature of the digital economy requires workers to develop both basic and advanced digital skills. According to the Digital India Annual Report (2022) and the PMKVY 3.0 Evaluation Report (2021), the most in-demand digital skills in Haryana include e-commerce, digital marketing, data analytics, cloud computing, and cybersecurity. However, current training programs do not always align with the needs of the job market. The NSDC Report (2021) suggests that programs need to be more specialized to address emerging sectors such as artificial intelligence, machine learning, and automation technologies.

Moreover, data from the Digital India Programme indicates a significant gap in digital entrepreneurship skills, with many youths unable to leverage digital tools to create online businesses or engage in freelancing (Ministry of Electronics & Information Technology, 2022). This gap reflects the need for training that focuses not only on employment-based digital skills but also on developing entrepreneurial capacities to take advantage of online platforms.

Strategies for Enhancing Digital Literacy and Skill Development: To overcome the barriers and enhance digital literacy and skill development in Haryana, several strategies can be proposed. According to the NSDC (2021) and Digital India Annual Reports, expanding access to digital infrastructure—including internet connectivity and digital devices in rural areas—is essential. Additionally, leveraging online platforms and mobile-based training modules could overcome geographical and infrastructural limitations, especially in remote areas.

Public-private partnerships (PPPs) are another key strategy to improve the effectiveness of skill development programs. The Digital India Programme (2022) highlights successful examples of collaborations with tech companies to provide industry-relevant training, and the PMKVY report (2021) recommends scaling such initiatives to provide more advanced digital training opportunities. Targeted outreach programs aimed at women, senior citizens, and low-income groups can help address the digital gender divide and ensure inclusive digital literacy (Haryana Skill Development Policy, 2016).

Moreover, integrating digital skills into formal education systems at all levels and promoting industry-academia collaborations for curriculum development are critical to building a workforce capable of meeting the demands of the digital economy (Sharma & Jha, 2023).

The secondary data analysis reveals that while significant progress has been made in Haryana's digital literacy and skill development programs, there are still substantial gaps, particularly in rural areas and among marginalized communities. Barriers such as poor infrastructure, limited access to digital devices, and socio-economic factors hinder the widespread adoption of digital skills training. To meet the demands of the digital economy, Haryana must focus on upgrading digital infrastructure, expanding access to advanced digital skills training, and ensuring inclusivity through targeted programs for women, older workers, and low-income households.

The analysis is based on secondary data collected from various credible sources, including:

Data Collection from different data sources	
Government Reports	Haryana's **Skill Development Policy (2016)** and its **Annual Reports** provide insight into the state's strategy and implementation of skill training programs. **PMKVY Program Evaluation Reports** published by the Ministry of Skill Development and Entrepreneurship, which detail the reach and effectiveness of the training programs. **Digital India Annual Reports** and related government documents that focus on the status of digital literacy across India, including Haryana.
National Reports	**National Skill Development Corporation (NSDC)** **National Sample Survey Office (NSSO)** Reports on digital literacy and the adoption of digital skills among India's workforce.
Academic Literature	Published studies and research articles, which examine the impacts of digital literacy and skill development programs in Haryana.
Data Coding and Analysis	
Data Coding	The documents were systematically reviewed to identify key themes, including • Digital literacy levels (urban vs. rural) • Existing skill development programs (PMKVY, Digital India, etc.) • Barriers to digital literacy • Alignment of training programs with digital economy demands
Thematic Analysis	Themes such as infrastructure gaps, gender disparities, and sector-specific skill needs were extracted and compared across different reports.
Synthesis and	The findings from the document analysis were synthesized to

Interpretation	draw conclusions about the effectiveness of existing skill development initiatives and identify areas for improvement.

Thematic Analysis

The analysis of secondary data on digital literacy and skill development in Haryana reveals several recurring themes, each highlighting key challenges and opportunities for improving the state's workforce readiness for the digital economy.

Theme 1. Urban-Rural Divide in Digital Literacy

A consistent theme throughout the documents is the significant digital divide between urban and rural Haryana. Reports such as the NSSO (2019) and NSDC (2021) reveal that while urban areas benefit from better digital infrastructure and higher internet penetration (68% in urban vs. 27% in rural areas), rural regions face substantial barriers in accessing digital resources. This divide manifests in both digital access (devices, internet) and skills, with rural residents lagging in digital literacy and access to training programs (Sharma & Jha, 2023).

Theme 2. Challenges in Program Reach and Effectiveness

Many reports indicate that while programs like PMKVY and Digital India have made strides in digital literacy, their effectiveness remains limited in rural areas. The PMKVY 3.0 Evaluation Report (2021) notes that training centers are largely concentrated in urban areas, leaving rural populations underserved. Additionally, the quality of training often fails to meet the demands of emerging digital skills like data analytics, AI, and cybersecurity, which are essential for future employment in the digital economy (Patel & Luthra, 2021).

Theme 3. Socio-Economic and Gender Barriers

Another dominant theme is the socio-economic divide, which hinders access to digital training, particularly among marginalized groups. According to the NSDC (2021) and Digital India Report (2022), women in rural Haryana are disproportionately excluded from digital literacy initiatives due to cultural, educational, and financial barriers. Older workers and low-income households also face significant challenges in accessing both training programs and the necessary technology, further exacerbating digital exclusion (Ministry of Electronics & Information Technology, 2022).

Theme 4. Infrastructure Gaps

Infrastructural limitations, particularly internet connectivity, are a pervasive theme across all reports. Despite initiatives like Common Services Centres (CSCs) under the Digital India Program, the NSDC (2021) and Haryana Skill Development Mission (2022) reports highlight that unreliable internet access and inadequate infrastructure remain key obstacles to effective digital skill training in rural Haryana. This issue underscores the need for greater investment in digital infrastructure to bridge the gap between urban and rural regions.

Theme 5. Skill Gaps and Emerging Digital Demands

A crucial finding across multiple reports, including NSDC (2021) and UNDP (2021), is the need for advanced digital skills to meet the demands of the evolving job market. Current training programs focus largely on basic digital skills such as

email use, online banking, and social media, but there is a growing need for specialized training in areas like data analytics, e-commerce, cloud computing, and cybersecurity to equip workers with the skills needed for jobs in the digital economy (Patel & Luthra, 2021; Sharma & Jha, 2023).

Theme 6. Strategies for Improvement
To address these challenges, several strategies are proposed across the reports. These include enhancing digital infrastructure, particularly in rural areas, through improved internet connectivity and the provision of affordable digital devices (NSDC, 2021). Additionally, public-private partnerships (PPPs) are highlighted as a potential solution to scale up digital skill training and ensure alignment with the industry's evolving needs (Digital India Report, 2022). Targeted outreach programs for women, older workers, and marginalized communities are also essential to overcoming the barriers of digital exclusion and promoting inclusivity in the digital economy (Haryana Skill Development Policy, 2016).

Conclusion
The study critically examined the state of digital literacy in Haryana, revealing a persistent urban-rural divide and systemic barriers that hinder inclusive digital empowerment. While national and state-level skill development initiatives such as PMKVY and Digital India have made measurable progress, their impact remains uneven due to infrastructural constraints, socio-economic disparities, and insufficient alignment with the demands of the digital economy. The analysis, grounded in Human Capital Theory and the Capability Approach, reinforces the understanding that digital literacy is both an economic asset and a vehicle for individual empowerment. However, current interventions tend to emphasize basic digital competencies, overlooking advanced digital skills crucial for employment in high-growth sectors. To equip Haryana's workforce for the digital future, there is an urgent need for targeted, localized, and inclusive policy frameworks that address infrastructural gaps, promote digital inclusion for marginalized groups, and establish stronger linkages between training and labor market demands.

Theoretical Implications
The study reaffirms that digital literacy is a critical form of human capital, influencing employability and income potential in the digital economy. It extends classical human capital frameworks by integrating contemporary digital competencies into the notion of productive investment in skills. Further, the research supports the Capability Approach by demonstrating how digital literacy enhances individual agency, particularly for rural and marginalized populations. It highlights digital skills not just as tools for employment, but as enablers of broader socio-economic freedom and participation. By analysing state-level interventions in digital literacy, the study offers a policy-oriented application of developmental theories, showcasing how digital skill development acts as a bridge between state capacity, individual empowerment, and equitable growth.

Practical Implications
The findings of the study suggest the need for revamping digital training programs to include advanced and job-relevant skills such as data analytics, cloud computing, and digital entrepreneurship, beyond just basic ICT training. Poor internet connectivity and limited device access must be addressed through

increased investment in rural digital infrastructure to ensure equitable access to training resources. Special focus should be placed on including women, senior citizens, and economically disadvantaged groups in digital literacy programs. This includes designing flexible, localized modules and deploying mobile-based learning platforms. Strengthening collaborations between the government, private tech firms, and educational institutions can bridge the gap between training content and actual market needs, enhancing both scalability and effectiveness of digital literacy programs. The study calls for improved mechanisms to evaluate the outcomes of digital literacy programs, focusing not only on participation rates but also on actual employment transitions and skill application in real-world settings.

Limitations and Further Scope of the Study

This study has several limitations. First, it relies heavily on secondary data from government reports and program evaluations, which may not reflect the most up-to-date trends or capture real-time changes. Second, regional disparities within Haryana, especially between urban and rural areas, may not be fully addressed through aggregated state-level data. Additionally, the focus on basic digital literacy may overlook emerging skills like AI, data science, and cybersecurity, which are critical for the evolving job market. The study also lacks detailed insights into the challenges faced by marginalized groups such as women and older workers.

For further research, primary data collection through surveys and interviews could provide deeper insights into regional variations and specific barriers to digital literacy. Longitudinal studies assessing the long-term impact of training programs on employment outcomes and a focus on sector-specific skills could also offer valuable recommendations for policy and program improvements.

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