

Digital Literacy and Artificial Intelligence in Bridging the Digital Divide: Pathways to Sustainable Development in India

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Abstract:

The expansion in digital technology and AI is the need of the hour for sustainable development in India, as it has transformed the various aspects of life such as governance, education, healthcare, economy and business system across the World. Now the entire World is connected to an invisible power of AI and The Digitalised System. However, there is unequal access and possibilities to digital infrastructure gaps often referred as the digital-divide in many developing countries.

This paper examines the role of digital literacy and artificial intelligence in reducing the digital-divide in the society and to promote Sustainable development and new opportunities for a better future. The study adopts a policy analysis approach and examines various national initiatives that aim to strengthen digital infrastructure and AI driven innovations, such as growing emphasis on Digital India Initiative, Also AI summit of 2026 happened in Delhi recently for enabling the inclusive growth. But it is important to cope with the problems and inequalities like digital-divide to see the progress and broadband expansion in rural areas as well. According to the data of 'The Times of India' only about 38% of Indian household are digitally literate and have basic ICT skills (Times of India, 2025).

The study further argues that strengthening digital literacy and programs and the progress in AI can help us in bridging this digital inequalities and contribute to achieve the sustainable development goals (SDG's). This study examines how digital literacy and AI technology can reduce technology based inequality or digital-divide, and how it supports inclusive and sustainable development in India. The present paper adopts a descriptive, qualitative and analytical research design and it's conceptual in nature and tries to understand the role of digital Literacy and artificial intelligence to bridge the gap or digital divide and promote sustainable development in India. The study analyzes government reports and policies to understand how the digital divide can be addressed and transformed into new opportunities for future development.

Keywords: Digital Literacy, Artificial Intelligence, Digital Divide, Sustainable Development, Digital Inclusion

Introduction:

The world is going through the third revolution in history first revolution was derived by the invention of steam and then the second one was by electricity, the third and current revolution we see is unfolding the idea of information technology and now the AI (Rai & Sharma, 2019).

The issue of the digital-divide has gained increasing attention of everyone of us in the context of rapid technological advancement in all the sectors and to integrate artificial intelligence (AI) into various sectors for growth and development of the nation. Recent studies highlight that while AI has potential to transform and make the education, governance, and economic opportunities better, it may also deepen existing inequalities if not implemented inclusively or according to the needs of citizens.

This paper examines about how digital skills and artificial intelligence or AI can help us in reducing the gap between people who have access to technology and those who may do not, in order to promote inclusive and long-term and sustainable growth and development in India. This study utilizes a qualitative and analytical framework, policy analysis, governmental reports, and contemporary scholarly literature to investigate the influence of digital literacy and artificial intelligence in bridging the digital-divide and gap in India. The results indicate that digital literacy improves individuals capacity to access and learn with digital technologies and AI, thus fostering inclusion and sustainability in educational, governmental, and economic and all other spheres. The study also shows that there is a strong link between artificial intelligence, digital access, and inclusive development. It shows how AI-powered tools can make service delivery better, allow for personalized learning, education , and open up new opportunities for people and citizens.

Objectives of the study:

1. To understand the concept of digital literacy and artificial intelligence in the context of sustainable development in India.
3. To examine the role of digital literacy in improving citizens' access to digital technologies and public services in India.
4. To Evaluate major Government of India initiatives and policy frameworks and policies

Decoding Important Terms:

By **Digital literacy** we mean the ability by which a person can use available digital devices, applications and internet safely and in effective manner according to our needs. It includes various skills like using a smartwatch, smartphone, computer, laptop, Google platform like email or whatsapp messages, UPI online payments method and online government services etc. for example if a person needs to check the traffic on their way by using internet and smartphones they can check it on Google maps application. Likewise if a farmer can check the weather forecast or crop prices using a mobile phone so we can say that the farmer is digitally aware and literate. In simple way digital literacy is known for the use of digital technology in different spheres of life.

Similarly **Artificial Intelligence (AI)** means some platforms, machines, computers Or system by which we can search and it can provide results, it can think, learn and make decisions like humans. AI is well known nowadays for its smart work and for analysing a large amount of data and to give smart responses on one tap. There are various examples like chatgpt, gemini, deepseek, google assistant or Siri, Alexa, Gemini, meta AI and smarbots for customer service in different applications and AI based doctors diagnose diseases. AI is a system that can learn and help humans with quick results and solutions.

Digital divide means the gap between the people who have access and reach to global technology But maybe others may not have these (Rai & Sharma, 2019).

Bridging the Digital-Divide means reducing or removing the gap, to give internet access to villages to cope with the digital-divide, providing digital education to all, making technology affordable for everyone, to teach people about use and function of AI or digital tools and applications.

Pathways means methods, strategies or ways to achieve something. And **Sustainable development** in this context of digital literacy and AI means to improve people's life today without harming the ability of future generations to live well. It focuses on economic growth, social equality and environmental protection and this concept can be seen in terms of Sustainable development goals as well. This concept was popularised by the United Nations through Sustainable Development Goals which talks about 17 goals to be fulfilled by 2030. For Example: Online Healthcare services in rural areas for healthcare development, digital one tap banking helping financial inclusion, chatbot service for banking, internet and customer and consumers related fields, digital education, online learning platforms like MOOCs etc. All these methods help society develop in a long-term and inclusive way.

The Digital -Divide:

The digital divide or disparities among people in field of digital technology is a serious concern. In India it's multidimensional because it includes disparities in access, Use, Skills and Connectivity.

When we talk about digital-divide it has many types which also considers other intersecting inequality we have such as:

The first thing is '**Access Divide**' which refers to unequal availability of internet and devices or connectivity. According to the times of India's recent statistics in the field of education, which shows that only 57% of schools in India have computers in working condition or functional computers and 54% have internet connectivity; it highlights significant infrastructural gaps. In rural areas people face more poor connectivity and limited infrastructure challenges (Times of India, 2025).

In India we also see '**Skill Divide**' which means that even after getting infrastructure, connectivity and internet, many citizens lack the knowledge and skills about using these technologies which is required to use the digital tools effectively. Research indicates that only 12% of Indians over the age of 15 have basic computer literacy. However In India many schools have Introduced AI and IT as Subject (Aqartia, 2025).

Then '**Urban-Rural Divide**' which is more about Cities and Villages reality where because of Urban-Rural Divide we have difference among opportunities in different locations. It's more about the debate of Cities V/s Villages.

'**Rich-Poor Divide**', is associated with affordability of devices, because of which poor people are unable to get those digital devices which are easily accessible to Rich people. Which further can expand this inequality to a large extent.

'**Gender divide**' which talks about that women's have less access to technology whether they are from Urban Area or Rural. One of the reason is that they spend more time with their family and less time over anything else or for learning something like digital technology or AI.

The digital Inclusion not only talks about infrastructure development or internet connectivity but also is related to skill and training in a true manner. Digital Inequality is also influenced by some other factors such as '**Social Economic Divide**' such as:

- Income differences
- Gender Inequality or Unequal Access to Technology
- Educational Background
- Intersecting Inequalities and Exclusion of any kind

Aquartia (2025) highlights that digital literacy levels in India majorly remains low, particularly in rural areas, contributing to expanding the digital-divide. Studies shows that 67% of Urban Residents use the internet compared to the residents of rural areas who use about 37% of it. The divide affects all the aspects of life and Digital services whether it's education, employment, e-governance or any other opportunities or aspects.

Understanding AI , Inclusive and sustainable development:

Emerging technologies such as artificial intelligence are creating new opportunities to bridge this gap, AI can support governance, personalised education, digital agriculture, selling-buying consumer services, health services etc. Artificial intelligence has the potential to transform Indian classrooms by promote personalised learning according to the needs of the people and addressing digital inequalities when implemented through structured framework (Yaduvanshi, 2025). AI in many ways improves learning in different Spheres of life but also increases inequality. It showcases that rural and poor students lack of access to the technology and tools, for this, the solution can be infrastructure development, policy making and digital literacy programs (Vesna et al. 2025).

Rai and Sharma, 2019 explains that Institutions such as libraries can play an important role in promoting and Bridging the digital-divide and further explains the multiple layers of this problem such as:

- No access to ICT
- Access but no skills
- Skills but no awareness
- Language barriers (Mostly the content is in English)

In this context digital literacy is essential tool to access information, Use of digital tools and technologies, to participate in society, To remove any kind of digital-divide (Rai & Sharma, 2019).

In an article on AI literacy and India vision 2027 (2025) author tries to point out AI literacy as an essential idea for future work force and suggests integration of AI in universities as well. He further supports India's vision of '**Viksit Bharat 2047**'. The realisation of the Idea of '**Viksit Bharat 2047**' relies on the integration of emerging technologies specifically AI across multiple sectors for sustainable and inclusive development (Rehman et al., 2025). Furthermore Malik. R (2018) focus upon modern education and social challenges to achieve sustainable development goals (Malik, 2018)

Digital literacy, Inclusive development & Government Initiatives:

Digital literacy is a crucial component of inclusive digital development as it can be understood by the government initiatives that have been introduced to promote the digital literacy in India.

1. **Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA)** : Government of India introduced this initiative for Digital literacy in rural India. Under this scheme around 7.35 crore candidates were enrolled and 6.39 crore trained out of which 4.78 crore candidates were certified. It trained millions of rural citizens in basic digital skills such as Using smartphones, UPI and online payments, Accessing government services etc.
2. **BharatNet**: It's one of the important and biggest rural telecom project in the world implemented in a phased manner to all gram panchayats of India(approximately 2.5 lakh) for providing all the non-discriminatory access to broadband infrastructure for world's largest rural broadband initiative. So far 2,14,325 gram panchayats are connected through the BharatNet Project.

Additionally 1,04,574 Wi-Fi hotspots and 12,81,564 fibre-to-the-home (FTTH) connections are commissioned and installed to ensure the last-mile connectivity.

3. **Digital Education Platforms:** In this AI world there are many digital platforms that support online learning and digital literacy including:

- **Massive Open Online Courses (MOOCs):** These are free or low-cost, web-based educational platforms offers unlimited participation, offers courses to students all over India with a flexible learning environment (self-paced or instructor-led) across diverse subjects, with popular providers including Coursera, edX, and SWAYAM for all streams students. It includes lectures, quizzes, peer feedbacks which makes learning interesting.
- **National Digital Library or Rashtriya E pustakalay:** It's easily accessible digital library, virtual repository of learning where we can search, find, read multiple books of difference subjects and streams on one tap. To make learning resources available through a single-window to the learners, National Mission on Education through Information and Communication Technology (NMEICT) has sponsored the National Digital Library of India (NDLI) project and arranged funding through Ministry of Education, Govt. of India (Ministry of Education, Government of India)
- **National Programme on Technology Enhanced Learning (NPTEL) :** It's a project of MHRD, by seven Indian Institutes of Technology in 2003, to provide quality education to anyone interested in learning from the IITs. The primary objective was to develop web and video courses for undergraduate and graduate students in all major engineering and physical science fields, as well as postgraduate management courses which helps students learn without spending allot of money.
- **Wisdom on Wheels:** It is a mobile digital literacy lab that has been introduced in the rural areas to train citizens in basic computer knowledge and skills and internet use (Times of India, 2025).

These platforms provide online courses for free to millions of learners all across India. All such initiatives by the government of India and concerning authorities tries to reach remote communities to connect them with digital literacy programs. In a report by UNESCO (2018) on digital literacy in education the core focus was on integrating digital literacy globally in education which tells us about the importance of AI, Information Technology in education. It also thinks about the technical skills in not just literacy but also critical thinking, media literacy, information literacy and communication skills also. It emphasize upon the idea of lifelong learning and adaptability in this digital age. It advocates about the inclusion so that we can bridge the digital divide it also suggest to reform in curriculum by which we can integrate ICT in teaching-learning process which is the basic step to reduce the digital-divide divide. Hence, digital literacy is an essential aspect for participation in modern society and must be embedded in education systems holistically (UNESCO, 2018).

AI as Catalyst:

Artificial Intelligence (AI) significantly enhances the digital inclusion by providing skills making digital services accessible, by improving efficiency to learn and gain knowledge, skills and personalization of services according to the needs of each and every student. AI can perform certain task in the field of

education like - Report making or automated feedback or making progress report of students, In making and providing customized study notes and materials, In identifying the learning gaps and taking feedbacks from parents and students. Nowadays online learning is rapidly growing and reaching the last mile as well. Research suggest that AI driven Educational platform helps and supports students as it connects them with mentors without worrying about geographical limitations.

Nowadays from railway bookings to payments, document verification to applications, from learning to business, from teaching to development, from researching to writing everything is online. The Indian government has introduced initiative for training the citizens in AI and emerging technologies. Government is also providing free AI training to almost 5.5 lakhs of village entrepreneurs so that our economy and business infrastructure can grow and help in the development of our country (ETtech, 2025). Artificial intelligence also helping us out in transforming the field of **governance** through:

- Research and Data-driven policy making
- Smart city management and New business development Ideas
- Digital service delivery for easy access

These technologies help governments deliver services more efficiently and transparently and helps in improving lives of people.

Digital literacy, AI & Sustainable Development:

Digital inclusion is closely linked to achieve the sustainable development goals (SDG's) :

1. **Education (SDG 4)** – Digital platform driven education systems helps to improve the access to quality education especially in remote and rural area, as the idea of education is last-mile connectivity.
2. **Gender Equality (SDG 5)** – The digital literacy programs helps to empower women's by improving access to education, digital learning, employment, government services, financial services and banking etc.
3. **Economic Growth (SDG 8)** - With the help of digital skills citizens can participate in economy and can have access to the new employment opportunities worldwide.
4. **Reduced Inequality (SDG 10)** – Digital literacy promotes digital inclusion that help all the groups specifically marginalised community to access the opportunities that were previously unavailable to them.
5. **Industry, innovation and Infrastructure (SDG17)** – It aims to build resilient infrastructure, to promote inclusive and sustainable industrialization, and foster innovation.

Findings and Results:

The present study explores the role of digital literacy and artificial intelligence in bridging the digital divide and to promote sustainable development in India. After analysing the existing literature and policy documents related to the research, we came to know that digital literacy is an important factor which enables people to have access to use digital technologies effectively. The findings maybe useful for researchers, educators, development practitioners, administrators and policymakers in designing more inclusive kind of digital policies.

Artificial intelligence has the potential to empower the citizens and to improve service delivery in healthcare, education, governance, financial services, employment and almost all possible spheres, it helps to create greater opportunities for inclusive growth.

The study finds out about the schemes and initiatives of the Government Of India such as Digital India Mission, PMGDISHA, SWAYAM, NDLI etc. to strengthen the digital infrastructure to improve digital access across the country and to reduce digital divide and to improve digital access across the country. However the findings also indicate at the fact that digital divide continues to exist due to structural, socio-economic challenges like limited access of rural communities, economically weaker section, women, older adults still face limited access to digital technology and AI. We need more inclusive policies, digital capacity building programmes and trainings for responsible governance and for better use of technology for the users all across India.

The literature highlights that with the emerging concerns privacy protection, cybersecurity, ethical AI governance, and unequal AI accessibility issues are more visible. These challenges demonstrate that only technological advancement or development alone cannot guarantee us inclusive development unless we have equitable policy interventions and capacity building for it.

Challenges and Limitations:

Despite progress and changes there are several challenges in promoting sustainable development in India in the field of AI like infrastructure gap, digital skills shortage, affordability, lack of interest in people, ethical issues of AI, language barriers for regional language speakers, Rural-urban disparities etc. that can be resolved with the help of Sustainable Policy making and successful policy implementations for the benefit of all the citizens.

Conclusion:

India's journey towards digital transformation is at a turning point. Even though all the online services and digital infrastructure have grown, but Inclusive development and digital-divide still is a big concern. In order for citizen to efficiently engaged in the digital economy, Digital literacy is an essential skill. However, Technology alone can't eliminate the disparities and digital Inequality. Hence, It is crucial to take a comprehensive approach that includes ethical and responsible AI governance, Inclusive policies, digital skill training and infrastructure development. We need successful implementation of digital literacy programs, Policy making and Implementation that can benefit each and everything even after diverse needs, Ethical use of AI, removing language barriers, and AI driven solutions for this for promoting sustainable and inclusive development in India.

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